NEW APPLICATION

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AZ CORP COMMISSION
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Application for a Certificate of Environmental Compatibility

L-00000NN-09-0541-00151

Hualapai Valley Solar Project

Submitted to:
State of Arizona
Power Plant and Transmission Line Siting Committee

By:
Hualapai Valley Solar LLC

Arizona Corporation Commission
DOCKETED
NOV 23 2009
DOCKETED BY

Date: _____
Case No. _____

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2. **Name, address, and telephone number of a representative of the applicant who has access to technical knowledge and background information concerning this application, and who will be available to answer questions or furnish additional information:**

3. **Date on which the applicant filed a Plan in compliance with ARS §40-360.02, in which the facilities for which this application is made were described:**

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EXECUTIVE SUMMARY

Hualapai Valley Solar LLC (HVS or Applicant) is developing the Hualapai Valley Solar Project in Mohave County, approximately 27 miles north of Kingman, Arizona and 80 miles southeast of Las Vegas, Nevada (see **Figure ES-1**).

This Application, with accompanying exhibits, seeks a Certificate of Environmental Compatibility (CEC) allowing the construction of a 340 megawatt (MW) concentrating solar power (CSP) generating facility and two transmission line interconnections.

As an alternative, the Applicant may build a 500 MW photo-voltaic (PV) project using the same interconnections. In light of this possibility, this application is organized to address each environmental compatibility issue assuming the Project will use CSP technology or PV technology. The Project will require about 4,233 acres of land. The solar field and ancillary facilities for either the CSP or PV technology are referred to as the 'Generating Facility'. Unless otherwise noted, the environmental impacts presented in this application refer to the CSP technology. The Project using the CSP technology is referred to as the 'CSP Project' and that using the PV technology as the 'PV Project'.

The Applicant will interconnect the Project via one of two interconnections:

- Interconnection #1, an approximately 3-mile long electric transmission line that will interconnect to either the existing Mead-Phoenix 500kV electric transmission line, or the existing Mead-Liberty 345kV transmission line at a switchyard to be built by Western Area Power Administration (Western); or

- Interconnection #2, an approximately 6.5-mile long electric transmission line that will interconnect to the existing Mead-Phoenix 500kV electric transmission line, the existing Mead-Liberty 345kV transmission line, or the existing Moenkopi-El Dorado 500kV transmission line at a switchyard to be built by Western.

Both of the interconnections are referred to as the Gen-Tie. The application's environmental analyses apply to both interconnections.

The CSP Project will use proven parabolic trough solar thermal technology to produce electrical power using a steam turbine generator (STG). Steam to drive the STG will be supplied from a solar steam generator (SSG). The SSG receives heated heat transfer fluid (HTF) from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The CSP Project will be designed to produce 340 MW.

The PV technology will utilize crystalline silicon or thin film PV panels on single-axis trackers, or fixed tilt supports. The PV Project will produce up to 500MW.

The following characteristics associated with the Project site make it ideal for a solar project:

- High **in**coming **sol**ar radi**ation** (insolation) value;
- Minimal slope on the Project site;
- Close proximity to electric grid minimizing the length of the required Gen-Tie;
- Water availability;
- Proximity to transportation corridors;
- Located on available private land; and
- Nearest existing residence is located approximately 2.5 miles from the Project site with no active residential development near the Project site.

The analyses for this application also show that several critical elements of concern are not present or will not be affected by the siting, construction, or operation of the Project, including: wild and scenic rivers, areas of critical environmental concern (ACEC), or solid and hazardous waste.

The analyses also show there will be no significant direct, indirect or cumulative adverse effects on land use, cultural resources, wilderness areas, biological resources, special interest wildlife and plant species, ground or surface water quality, earth and soil resources, air quality, or noise. No significant impacts to minority or low income populations are expected to occur.

There will be socioeconomic benefits derived from the Project. The Project will create numerous economic impacts and benefits for Mohave County and the State of Arizona:

- Up to a maximum of 1,500 jobs created during the 2.5-3-yr construction period;

- Over 100 full-time jobs for plant operation;

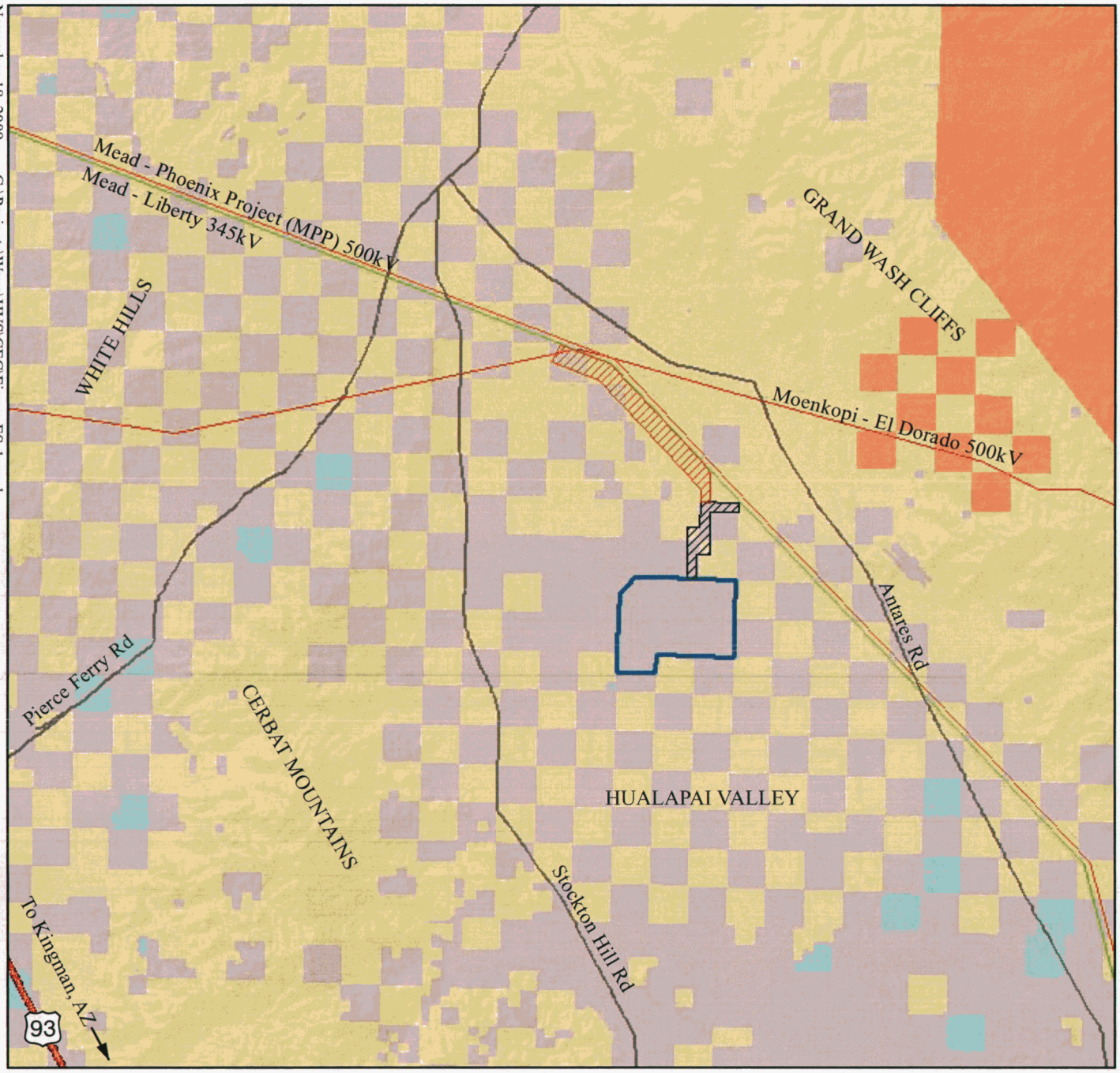
- County and State will see additional benefits from goods and services purchased for the Project, taxes generated by employment, and other taxes paid to state and local governments;

- Project will add to the county's and state's experience in promoting and attracting projects that generate renewable energy as well as industries and companies that support the development, construction, and operation of these projects (e.g., parabolic trough mirror suppliers); and

- The available power interconnecting to the local electric transmission system will provide a more robust and reliable electric service system and will help meet the demand for renewable energy and lower the dependence on fossil fuels.

The Applicant therefore requests approval of this application and submits that the Project and its location are environmentally compatible.

November 18, 2009 G:\Projects\Wapa\HVS\CEC\Figure ES-1.mxd



Legend

- Solar Facility
- Interconnection #1 Gen-Tie
- Interconnection #2 Gen-Tie

Ownership

- BLM
- Hualapai Indian Reservation
- Private
- State Trust

N

1:250,000

0 5 Miles

Ownership information from ALRIS (2006)

Project Area

Hualapai Valley Solar Project

Figure ES-1

hualapai valley solar™ a mohave sun power project

TRANSCON ENVIRONMENTAL

BEFORE THE
ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

In the matter of the Application of Hualapai Valley Solar LLC, in conformance with the requirements of Arizona Revised Statutes 40-360.03 and 40-360.06, for a Certificate of Environmental Compatibility authorizing construction of the HVS Project, a 340 MW parabolic trough concentrating solar thermal generating facility and an associated Gen-Tie line interconnecting the generating facility to the existing Mead-Phoenix 500kV transmission line, the Mead-Liberty 345kV transmission line, or the Moenkopi-El Dorado 500kV transmission line.	))))))))))	Case No. _____

1. Name and address of the applicant:

Hualapai Valley Solar LLC
85 Hamilton Street
Cambridge, MA 02139

2. Name, address, and telephone number of a representative of the applicant who has access to technical knowledge and background information concerning this application, and who will be available to answer questions or furnish additional information:

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3. Date on which the applicant filed a Plan in compliance with ARS §40-360.02, in which the facilities for which this application is made were described:

The Applicant filed a Plan in compliance with ARS 40-360.02 on August 11, 2009.

4. Description of Proposed Facility

Hualapai Valley Solar LLC (HVS or Applicant) is developing the Hualapai Valley Solar generating facility and associated transmission lines (Project) in Mohave County, approximately 27 miles north of Kingman, Arizona and 80 miles southeast of Las Vegas, Nevada (see **Figure 4-1, Project Area**).

This Application, with accompanying exhibits, seeks a Certificate of Environmental Compatibility (CEC) allowing the construction of a 340 megawatt (MW) concentrating solar power (CSP) generating facility and two transmission line interconnections.

As an alternative, the Applicant may build a 500 MW photo-voltaic (PV) project using the same interconnections. In light of this possibility, this Application is organized to address each environmental compatibility issue assuming the Project will use CSP technology or PV technology. The Project will require about 4,233 acres of land. The solar field and ancillary facilities for either the CSP or

PV technology is referred to as the 'Generating Facility'. Unless otherwise noted, the environmental impacts presented in this application refer to the CSP technology.

The Applicant will interconnect the Project via one of two interconnections:

- Interconnection #1, an approximately 3-mile long electric transmission line that will interconnect either the existing Mead-Phoenix 500kV electric transmission line, or the existing Mead-Liberty 345kV transmission line at a switchyard to be built by Western Area Power Administration (Western); or

- Interconnection #2, an approximately 6.5-mile long electric transmission line that will interconnect to the existing Mead-Phoenix 500kV electric transmission line, the existing Mead-Liberty 345kV transmission line, or the existing Moenkopi-El Dorado 500kV transmission line at a switchyard to be built by Western.

Both of the interconnections are referred to as the Gen-Tie. The application's environmental analysis applies to both interconnections.

4.a) Electric Generating Plant

This section of the application is organized to describe both CSP and PV technologies that could be developed on the Project site. Therefore, two versions of section 4.a are provided below, one to describe each technology. The Project using the CSP technology is referred to as the 'CSP Project' and that using the PV technology as the 'PV Project'.

4.a.i) Type of Generating Facility (CSP Project)

The generating facility will utilize CSP technology, a proven technology that uses arrays of parabolic mirrors to collect energy from the sun to produce electricity using a steam turbine generator (STG). The solar field increases the temperature of a heat transfer fluid (HTF) by routing the HTF along the focal points of the parabolic mirrors. A solar steam generator (SSG) then transfers heat from the HTF to water where its heat energy is used to generate steam. The steam produced in the SSG is then routed to the STG to produce electricity using the standard Rankine cycle. The CSP Project also includes a thermal energy storage system that stores solar energy in molten salt storage tanks so that energy can be used at a later time for generation of electricity during peak load periods of the day.

4.a.ii) Number / Size of Proposed Units

The CSP Project will be designed to produce a nominal gross electrical output of

340 megawatts (MW) using a single steam turbine. The Applicant may develop the CSP Project in two approximately 170 MW phases using two turbines.

4.a.ii.A) Site Layout and Arrangement

The majority of the Project site will be occupied by the solar field. Equipment and facilities have been arranged for maximum and best use of the Project site as well as to ensure efficient operability and maintainability. Conceptual engineering has been conducted to define the specific equipment requirements and to confirm the suitability of the proposed Project site.

The overall Project site layout is included on **Figure 4-2, CSP Project Layout.** A more detailed general arrangement of the Power Block is shown on **Figure 4-3, Power Block**.

Power Block

The Power Block will include one generator with a gross output of 340 MW, heat transfer fluid (HTF), heated by the solar field, will boil water that will power a conventional steam turbine generator, a molten salt-based thermal energy storage (TES) system (approximate capacity of 4-8 hours), cooling system, water system, electrical system, control system, and all other ancillary systems. The Power Block will be located in the middle of the site, and will cover an area of approximately 100 acres. Boilers burning either fossil fuel or biofuel within the Power Block will be used to provide maintenance steam for the turbine when it is not operating, freeze protection for the HTF, and possibly supplemental power production for portions of the year.

The major Power Block components are described in more detail in the sections below.

Solar Steam Generator System (SSG)

The SSG system includes feedwater heaters, deaerators, economizers, evaporators/boilers, steam superheaters, and reheaters. All heat transfer components are designed as shell and tube heat exchangers. The evaporator/boiler design is similar to any "kettle boiler" shell and tube heat exchanger in that the hot HTF is circulated through tubes and the steam is produced on the shell side.

Steam Turbine-Generator (STG)

Steam from the SSG expands through the STG turbine blades to drive the steam turbine, which in turn drives the generator. The STG is expected to be a multi-case reheat type, which could be supplied by Mitsubishi, Toshiba, Siemens, Alstom, General Electric, or other manufacturers. The STG is equipped with accessories required to provide efficient, safe, and reliable operation.

HTF Freeze Protection Heat Exchanger

To eliminate the potential problem of HTF freezing, steam-fed shell and tube heat exchangers will be used to keep the HTF at or above about 100°F whenever the facility is offline. The auxiliary boiler will provide the steam to these heat exchangers when necessary to perform this function.

HTF Expansion Tanks

Approximately three (3) expansion tanks and six (6) overflow tanks totaling approximately 3 million gallons of storage are required to accommodate the volumetric change that occurs when heating the HTF to the operating temperature. Nitrogen will be used to blanket the headspace of these tanks to prevent oxidation or contamination of the HTF by reducing its exposure to atmospheric air.

The HTF system is a closed-loop system. This area will be equipped with a berm of sufficient height to enable 110% storage capacity of the largest tank in case of a leak.

HTF Ullage/Flash System

During operation, the HTF will degrade over time into components that have high and low boiling points. Those components are captured as vapors and either condensed and re-injected back into the closed HTF loop, or removed by carbon filters, waste drain tanks, and other emission control systems.

4.a.ii.B) Solar Generation System

The CSP Project solar field will cover approximately 2,791 acres and will include approximately 3,852 solar collector assemblies (SCA).

The SCAs are single axis tracked and aligned on a north south axis, thus tracking the sun from east to west. An SCA consists of parabolic-trough mirrors that concentrate the sun's energy (around 80 times) onto heat collector elements (HCE). The HCEs are collector tubes that are placed exactly in the focal line of the mirrors. The tube is enclosed by a glass cylinder, which enables an insulating vacuum between the black tube and the atmosphere. The mirrors and HCEs are mounted on a metal support structure or frame. Each SCA is provided with local control and security instruments as well as an actuating system, enabling it to follow the sun, independently concentrating or avoiding the sun's rays on the focus of the parabola thus preventing the HTF from overheating. Additional equipment protects the system from mechanical damage.

During operation, 'cold' HTF at approximately 295°C (563°F) is pumped from the Power Block through a cold header pipeline that distributes it to the parallel SCA loops in the solar field. Each loop is made up of four SCAs grouped in two

adjacent rows and connected by a header pipe. The HTF is heated in the field loops and collected in a hot header pipe, where it is returned to the Power Block at approximately 395°C (743°F).

Access to the solar field will be from the south where the visitor's center and administration areas will be located. The Power Block access road will continue across the solar field, dividing it into east-west and north-south sections. A service road will surround the solar field, running inside the Project fence line.

In addition to the SCAs, the major equipment for the Project's solar field is described in more detail in the following sections:

Heat Collection Element (HCE)

The HCEs consist of a steel tube with a selective coating, surrounded by an evacuated glass tube insulator. The coating gives it excellent uni-directional heat transfer properties, and the evacuated glass tube enclosure protects the selective surface and reduces heat loss by insulating it.

The outer glass cylinder has anti-reflective coating on the inner and outer surfaces to reduce reflective losses (increasing the transmissivity). Typically, "getters" (metallic substances that are designed to absorb gas molecules) are installed in the vacuum space to maintain its insulating properties by absorbing hydrogen and other gases that permeate into the vacuum annulus over time.

Mirrors

The Project will use low-iron glass mirrors that are reliable components exhibiting no long-term degradation in reflective quality. Mirrors can be cleaned and brought back to like-new reflectivity. Mirrors have been shown to have long term endurance, as evidenced at the SEGS CSP plants in southern California, parts of which have been operating since 1984. SEGS experience shows that a mirror life of 30 years or more can be expected for the CSP Project.

The mirrors would be regularly monitored to ensure that they maintain their optimal reflectivity. This continuous monitoring of mirror reflectivity provides a valuable quality control tool and helps to minimize wash labor and the amount of water used for cleaning. Each mirror would be washed as needed using demineralized water.

Heat Transfer Fluid (HTF)

The HTF that will likely be used for the CSP Project is Therminol™ (VP-1), or equivalent, an aromatic hydrocarbon, biphenyl-diphenyl oxide manufactured by Solutia. Therminol is a high-temperature synthetic oil with an excellent operating history. It is used in many heat transfer processes, including the SEGS solar facilities currently in operation. DOWTHERM A – manufactured by Dow Chemical

– has similar properties to Therminol™ (VP-1) and is an example of an acceptable alternative.

Ball Joint Connectors

A hard-piped assembly with ball joints is proposed to be used to connect the SCAs to each other and to the headers. The ball joint assembly has a number of advantages over previous designs using flexhoses, including lower cost, lower head loss, and reduced heat loss.

HTF Piping Header

Supply and return piping of HTF is routed to maintain balanced flow through all the HCEs. Expansion loops will be located as required to minimize pipe stress. The SCA array will be designed and constructed to allow movement from thermal expansion without damage to the piping by connecting the steel piping in the mirrored trough sections of the array with ball joints and not rigidly mounting the piping to foundations or other structures.

4.a.ii.C) Thermal Energy Storage (TES)

A TES system will be installed as part of the CSP Project to allow longer daily runtime, to support the shifting of morning solar resource to generation during afternoon and evening hours when electricity demand is higher, and to reduce effects of local cloud cover (intermittency).

The proposed TES system is designed to store approximately 3,000 megawatt-hours thermal (MWht) of solar thermal energy, which represents approximately four (4) hours of full load STG operation. The TES will be an indirect storage system using molten salt as the energy storage material.

A "two tank per module" system will be used, which is the most proven TES technology to date and consists primarily of the following:

- Hot salt storage tank
- Cold salt storage tank
- Salt-to-HTF heat exchangers
- Molten salt transfer pumps.

During the "storage" process, the TES system transfers molten salt from the cold salt storage tank (approximately 550°F) through the heat exchanger to the hot salt storage tank (approximately 720°F) gaining energy from the hot HTF (740°F). This process is reversed to generate electricity from thermal storage. During this process, the hot HTF temperature will be approximately 700°F as compared to 740°F during normal operation, resulting in lower steam temperatures and thus lower STG efficiency when compared to direct operation without storage.

4.a.ii.D) Auxiliary Boilers and HTF Heaters

An auxiliary steam boiler burning either fossil fuel or biofuel will also be included in order to provide steam as needed for the steam turbine seal steam system while the STG is offline and during start-up. Sealing steam is used to prevent air from entering the steam turbine while the condenser is under vacuum. Once the Generating Facility commences generation of electricity for delivery to the electrical grid, the use of the auxiliary boiler ceases and it is held in stand-by mode until auxiliary heat is again required for STG maintenance.

Freeze protection heat for the HTF will be provided by about ten (10) HTF heaters, each having a capacity of about 10 MWt. These HTF heaters will heat the HTF directly to prevent the HTF from falling below about 100°F. They may also be used to provide heat for electricity generation for short periods when energy demand is high and there is insufficient solar energy available. These HTF heaters will burn the same fuel as the auxiliary steam boiler.

4.a.ii.E) Emergency Generator

During normal operation, station service power is provided by the CSP Project, or from the transmission system (back fed through the transformer to the Generating Facility electrical system) when the Project is not generating electricity. A diesel powered generator and designated uninterruptible power supply (UPS) will be required for safe shutdown of the solar field SCAs in the case of a transmission failure. The UPS system is designed to rotate all SCAs approximately three (3) degrees to the east to focus the solar energy away from the HCE tubes thus preventing vaporization of the HTF fluid in a non-circulating state. The emergency generator will then be used to place the solar field SCAs into the stowed position. Each of the solar field sections will be stowed separately thus reducing the required size of the diesel generator. The emergency generator will also operate other power island equipment necessary for a safe system shutdown including the HTF pump at minimum flow, STG lube and jacking oil pumps, instrument air compressor, UPS battery charger, and emergency lighting. The generator size is estimated to total approximately 12 MW.

4.a.ii.F) Auxiliary Cooling System

The auxiliary cooling system provides cooling for plant equipment including the STG and lube oil. The auxiliary cooling system includes a closed cooling water system that rejects heat to the plant cooling tower system.

4.a.ii.G) Electrical System Description

An overall one-line diagram of the major electrical systems is presented in

Figure 4-4, Single-Line Diagram.

Electrical Generation

Three-phase power will be generated by the STG at 21kV and stepped up by a fan-cooled generator step-up (GSU) transformer to transmission voltage. Power will be transmitted through an approximately three-mile Gen-Tie line.

Within the Project switchyard, the generator circuit breaker will be rated to carry the full load current of the generator. A disconnect switch will be included on the load side of the generator circuit breaker for generator disconnect and transformer maintenance. An isolated phase bus duct will connect the generator to the generator circuit breaker and the generator circuit breaker to the GSU transformer.

The transformer will use non-PCB-containing insulating oil and will be set on a concrete pad with a perimeter berm designed to contain the oil in the event of a leak or spill.

Auxiliary Electrical System

Start-up and station-service power will be back-fed through the 21 kV to 13.8 kV then to 4.16 kV step-down transformers referred to as the unit auxiliary transformers (UATs). The system will be configured to allow power for auxiliaries to be supplied through the GSU transformer and the UAT regardless of whether the STG is online or offline. The stand-by electrical power requirements will be supplied in this manner.

A DC power supply and an essential service AC system will provide power to ensure that critical safety and equipment protection control circuits are always energized and able to function in the event of unit trip or loss of grid power. The battery bank will be sized to power the DC loads and essential service AC loads through an inverter for a sufficient amount of time to provide for safe and damage-free shut down of the power plant.

Grounding

The electrical system is susceptible to ground faults, and lightning and switching surges that can pose hazards to site personnel and electrical equipment. The station grounding system provides an adequate path to ground to permit the dissipation of current created by these events. The station-grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentration.

On-Site Electrical Use

Roughly 150 GWh per year will be used onsite for auxiliaries such as pumps,

control systems, and general facility loads including lighting and heating, ventilation, and air conditioning (HVAC). Some of the power needed for on-site uses will be converted from alternating current (AC) to direct current (DC) for power plant control systems and emergency backup systems.

4.a.ii.H) Operations

It is anticipated that approximately one hundred (100) individuals will be required to support CSP Project operations and maintenance.

Emissions Profile

The CSP Project will generate very low emissions of air pollutants and will obtain an air permit from the Arizona Department of Environmental Quality (ADEQ). It is anticipated the CSP Project will not require a Prevention of Significant Deterioration (PSD) or Title V permit given that the profile of annual emission of all pollutants is below the regulatory thresholds. The Project will be operated within the limits of the air permit issued by ADEQ.

Noise Profile

The primary noise sources anticipated with the CSP Project include the cooling tower unit, circulating water pumps, boiler feed pumps, HTF circulating pumps, STG, and auxiliary boiler. Secondary noise sources are anticipated to include the GSU transformers, and miscellaneous pumps, fans, and compressors.

Equipment purchased for the CSP Project will be specified to meet OSHA requirements. The noise analysis is presented in **Exhibit I**.

4.a.ii.I) Balance of Plant

The major balance of plant equipment and systems for the CSP Project are described in the following paragraphs.

4.a.ii.I.I) Water Treatment

The raw water, circulating water, process water, and mirror washing water used by the CSP Project all require on-site treatment. This treatment varies according to the quality required for each of the following uses.

Raw Water Treatment

Given the preliminary water analysis conducted for the CSP Project, raw water is expected to be treated prior to feeding to the circulating water system so as to increase the cycles of concentration at the cooling tower, and thereby minimizing water consumption and reducing the size of the evaporation ponds. Multiple water parameters require treatment to permit the higher cycles of concentration,

including alkalinity, total dissolved solids, total suspended solids, and silica.

The raw water treatment system may consist of various components including multimedia filters, strong acid cation exchangers, an interstage degasifier, and strong base anion exchangers. Chemical regeneration of ion exchange resins will likely take place on-site. The components of the water treatment system will be specified during the detailed engineering of the CSP Project, after more exhaustive water analysis has been conducted.

Circulating Water Treatment

Water conditioning chemicals may be fed into the makeup water to minimize corrosion and to inhibit mineral scale formation and bio-fouling. All chemical systems will include bulk storage tanks (or chemical tote for smaller systems) and redundant, full-capacity metering pumps. The anticipated chemical systems include the following:

- Sulfuric acid fed in an amount proportional to the circulating water makeup flow to adjust alkalinity and reduce mineral scaling;
- An organic phosphate inhibitor solution fed in an amount proportional to the circulating water blowdown flow to further inhibit scaling; and
- Sodium hypochlorite shock-fed into the circulating water system as a biocide to reduce bio-fouling.

Steam Cycle Process Water

Makeup water for the steam cycle must meet stringent specifications for suspended and dissolved solids. To meet these specifications, water is processed through a demineralized water makeup system. This system is anticipated to consist of multiple unit operations, concluding with leased mixed-bed demineralizers. The leased demineralizer trailers will be taken off-site for regeneration, and all waste product contained in the trailer will be disposed of at off-site facilities by the vendor, in accordance with applicable regulations. Water produced by this system will also be used for the mirror washing as described below.

Additional conditioning of the condensate and feedwater circulating in the steam cycle will be provided by means of a chemical feed system. All chemical systems will include a bulk storage tank (or chemical tote for smaller systems) and full-capacity metering pumps. The chemical systems may include the following:

- An oxygen scavenger for dissolved oxygen control to minimize corrosion;
- An alkaline solution for pH control; and
- A solution of disodium phosphate (DSP) and trisodium phosphate (TSP) to minimize scale formation in the SSG heat exchangers.

A steam cycle sampling and analysis system will monitor the water quality at various points in the Generating Facility's steam cycle. The water quality data will be used to guide adjustments in water treatment processes and to determine the need for other corrective operational or maintenance measures. Steam and water samples will be routed to a sample panel where steam samples will be condensed and the pressure and temperature of all samples reduced as necessary. The samples will then be directed to automatic analyzers for continuous monitoring of conductivity and pH. All monitored values will be indicated at the sample panel and critical values will be transmitted to the control room. Grab samples will be periodically obtained at the sample panel for chemical analyses to provide information on a range of water quality parameters.

Solar Mirror Washing Water

To facilitate dust and contaminant removal from the solar field, demineralized water will be used to spray clean the solar mirrors on a periodic basis, as determined by a reflectivity-monitoring program. This operation will generally be done at night and will involve a specialized mirror-washing water truck spraying demineralized water at the mirrors in a drive-by fashion. Demineralized water for mirror washing will be generated by the steam cycle makeup water treatment system. This process is designed to use the minimum water necessary for washing.

4.a.ii.I.II) Wastewater Management

Process Wastewater

CSP Project process wastewater will be produced by the cooling tower blowdown and neutralized wastewater from the ion exchange pretreatment system. Process wastewater will be piped into lined, on-site evaporation ponds. The ponds will be sized to retain all solids generated during the life of the Project. However, if required for maintenance, dewatered residues from the ponds will be sent to an appropriate offsite landfill as non-hazardous waste.

As shown in **Table 4-1, Water Uses**, the average flow to the evaporation ponds is approximately 80,000 gallon per day (gpd). The CSP Project will also generate a small waste stream from drains that will be directed to an oil/water separator. The oil-free water will then be returned to the raw water storage tank at the inlet for reuse. Any residual oily fluid will be stored in the oil/water separator prior to hauling off-site.

Evaporation Ponds

Evaporation ponds are a necessary component in the brine treatment process. The purpose of the brine treatment is to minimize the effluents and to recycle the water as much as possible. The cooling tower blowdown, regeneration effluents,

and concentrate from reverse osmosis will be collected in a buffer tank. The first step of brine treatment is the precipitation of all salts that could disturb the concentration of the effluents in the reverse osmosis system. The reverse osmosis system, designed for high salt content, will split the effluents into a high salinity concentrate and a permeate, which can be reused in the cooling tower. The high salinity concentrate will be discharged into evaporation ponds where the water will evaporate naturally. The salts that remain after evaporation will be retained for the life of the project and disposed during decommissioning in approved landfills as non-hazardous waste.

Multiple evaporation ponds covering up to 75 acres are planned to allow project operations to continue in event that a pond needs to be taken out of service. Each pond will have enough surface area to maintain an evaporation rate that exceeds the cooling tower blowdown rate at maximum and annual average design conditions. Pond depth will be sufficient to insure that the ponds will not need to have residual solids removed during the life of the Project.

The evaporation ponds will be designed to meet the Best Available Demonstrated Control Technology (BADCT) required to comply with the Aquifer Protection Permit (APP) that will be obtained from the ADEQ.

Sanitary Wastewater

The CSP Project's sanitary system will collect wastewater from sanitary facilities such as sinks and toilets. This waste stream will be sent to an on-site sanitary waste septic system and leach field. During any major maintenance events, portable facilities will be provided to accommodate the additional maintenance workers.

4.a.ii.I.III) Grading and Drainage

The Project is located on property currently used for grazing cattle. The Generating Facility will be graded into a series of leveled solar subfields that are separated by roads and ditches, with elevation drops between each of the individual subfields. On a whole, the elevation drops represent a general fall in elevation from the southeast to the northwest of about 0.5%. The CSP Project site will be graded to take advantage of the existing slope, while eliminating any abrupt grade changes at the edges of the solar subfields.

Maintenance roads will be constructed in an east west direction within the solar field. The roads will be spaced at intervals of about 2,000 feet to coincide with the separation between the SCAs. Interceptor ditches will be constructed along the south edge of these roads to collect storm water runoff. These ditches will slope to the west and will discharge into a collection ditch located on the northwest side of the site. This ditch will be configured, through slope considerations and construction materials to provide for efficient infiltration of storm water into the ground. Storm water that does not infiltrate will be directed,

via the collection ditch on the north side of the site, into a detention pond located in the northwest area of the Project.

A preliminary grading and drainage plan for the Generating Facility is presented in **Figure 4-5, Drainage Layout**.

4.a.ii.I.IV) Stormwater Management

The storm water system will consist mostly of open ditches, including all necessary gutters, gullies, traps, catch pits, etc., for the collection and evaporation/discharge of the clean storm water from the surface of the Generating Facility. For the design of the drainage system, the rates of rainfall indicated by the local meteorological conditions as well as the effective runoff coefficient for different surfaces of the site (roofs, roads, paved areas, free uncovered areas, etc.) will be considered. The final volume of the stormwater ponds, located on the north side of the Generating Facility, will be determined in the detailed design phase.

Off-site stormwater will be directed to channels along the Generating Facility boundary then back into their natural drainages so that they do not mix with on-site stormwater. All of the disturbance and earthwork for these channels will be on privately held project property.

Domestic wastewater will be collected and treated in septic tanks located near the site entrance as well as the administration buildings in the Power Block.

4.a.ii.V) Auxiliary Systems

The following auxiliary systems control, protect, and support the CSP Project and its operation. The CSP Project auxiliary systems include fire protection, distributed control system, communications, compressed air, lighting, and cathodic and freeze protection systems as described in the following paragraphs.

Fire Protection

The CSP Project's fire protection water system is anticipated to be supplied from dedicated raw/fire water storage tanks located in the Power Block. The storage tanks will hold full flow runtime. One electric and one diesel-fueled backup firewater pump, will deliver water to the fire protection water-piping network. The piping network will supply fire hydrants located at intervals throughout the CSP Project site as well as a sprinkler deluge system at each unit transformer, HTF expansion tank, and circulating pump area, and sprinkler systems at the STG and in the operations and administration buildings. A smaller electric motor-driven jockey pump will maintain pressure in the piping network.

The piping network will be configured in a loop so that a piping failure can be

isolated with shutoff valves without interrupting the supply of water to a majority of the loop. The piping network will supply fire hydrants located at intervals throughout the Power Block and sprinkler systems as needed in the Power Block and in the operations and administration buildings. Portable fire extinguishers of appropriate sizes and types will be located throughout the Generating Facility.

The fire protection system will be designed per NFPA standards and in compliance with all appropriate Mohave County and/or State of Arizona regulations (and approved by the designated Fire Marshall), utilizing equipment approved by Underwriters Laboratories/Factory Mutual Research Corp (UL/FM).

Distributed Control System (DCS)

The microprocessor-based Distributed Control System (DCS) will provide control, monitoring, alarm, and data storage functions for power plant systems. Redundant capability will be provided for critical DCS components such that no single component failure will cause a plant outage. The DCS will consist of the following major components:

- Computer monitor-based control operator interface (redundant);
- Computer monitor-based control engineering work station;
- Multi-function processors (redundant);
- Input/output processors (redundant for critical control parameters);
- Field sensors and distributed processors (redundant for critical control parameters);
- Historical data archive; and
- Printers, data highways, data links, control cabling, and cable trays.

The DCS will be linked to the control systems furnished by the STG supplier and to the solar field controls. These data links will provide STG control, monitoring, alarm, and data storage functions via the control operator interface and control technician workstation of the DCS.

Communications

Multiple communication systems will be required for construction and operation. During construction, use of hard-wired communications will be minimized and cellular or satellite methods will be used to the extent possible for Internet and phone access. Hard-wired systems required for operation communications will be installed on-site as part of the electrical construction activities. These items will include hard-wired phone, fiber optics, and Internet. External communications systems will use existing lines and rights-of-way to the greatest extent possible, or will use radio towers.

Compressed Air

The compressed air system will provide both service air and instrument air throughout the CSP Project. Service air will be provided at a regulated pressure to hose connections placed at intervals throughout the Power Block and will be used primarily for maintenance activities. The instrument air system will provide dry, filtered air for operation of control systems, primarily pneumatic valves. Two (2) 100-percent capacity compressors will be provided for the CSP Project.

Lighting System

Outdoor area lighting for the Power Block will consist of permanently mounted fixtures secured to structures, equipment, walls and poles as required to provide access lighting for operations and maintenance. Outdoor lights will be automatically controlled by photocells with manual override capability. The lighting system will be designed to provide nighttime lighting levels consistent with the Illuminating Engineering Society (IES) standards to allow basic operator movement throughout the Power Block.

Lighting will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be downward facing and shielded to focus illumination on the desired areas only. There will be no lighting in the solar field, so light trespass on surrounding properties will be minimal. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting will be used.

Cathodic and Freeze Protection Systems

Underground metal structures will have cathodic protection as necessary based on soil conditions. Freeze protection systems (heat tracing) will be employed to protect small water and condensate piping systems that cannot be easily drained.

HTF Leak Detection

Small leaks, possible at ball joints or other connections, will be located based on a daily visual inspection of the solar field. Those small leaks can then be corrected via repacking of joints or valves, or by minor repairs if needed. The ability to isolate loops and sections of the field will allow for quick repairs.

4.a.ii.J) Site Access

US 93 is one of the major north-south transportation routes in Arizona. The Project is located approximately 27 miles from US 93. Heavy equipment, construction materials and supplies, and labor required for CSP Project construction will be brought to the site via US 93. Stockton Hill Road will be used to access the site from US 93. Site access will require construction of a new 3.5-

mile road from Stockton Hill Road running east to the Site.

For contingency purposes, the CSP Project will develop a second means of access. The secondary access road will access the site from the east, via Antares Road. HVS anticipates that the access road between the site and Stockton Hill Road will be assigned to Mohave County in the future.

Locked man-gates will be provided in the CSP Project perimeter fencing.

Interior Roads and Fencing

The main access road from Stockton Hill Road as well as some of the roads in the Power Block will be paved. The remaining portions of the Power Block will be gravel surfaced or treated with a surfactant material to control dusting. The access roads in the solar field will remain unpaved and without a gravel surface to prevent damage to the mirrors.

The solar field and support facilities will be secured with a minimum 8-foot tall, chain link metal-fabric security fence with 1-foot barbed wire or razor wire on top. Controlled access gates will be located at the CSP Project entrance.

4.a.iii) Source / Type of Fuel

The primary fuel source for the CSP Project is solar. A supplementary fossil fuel or biodiesel will be used in the Generating Facility for supplementary firing, up to 2% of the annual solar energy input. This fuel will also be used for freeze protection firing as well as for maintaining conditions at the steam turbine during down time of the water/steam cycle. It will be stored in tanks with appropriate leak and spill control facilities, including 110% secondary containment, and all other provisions (e.g., Spill Prevention Control and Countermeasure Plan) required by the Aquifer Protection Permit that the Project will acquire from the ADEQ.

4.a.iv) Amount of Non-Solar Fuel Utilized

The Project will utilize up to approximately 180,000 Million British Thermal Units (MMBtu) of either a fossil fuel or biofuel per year. This will be allocated to turbine maintenance steam, HTF freeze protection, and energy generation. Assuming about 5000 hours per year for turbine maintenance steam and 400 hours per year of HTF freeze protection results in an annual use of about 70,000 MMBtu per year. The remaining approximately 110,000 MMBtu per year will be available for generation of electricity during high demand periods when solar energy is not sufficient.

Current design anticipates about 225,000 gallons of storage for fuel oil or biofuel. The Project is also studying the use of natural gas, which would not require any

storage on-site.

4.a.v) Type of Cooling / Sources of Water

4.a.v.A) Cooling

The Project includes two cooling systems; (i) the steam cycle heat rejection system, and (ii) the closed cooling water system (equipment cooling).

Steam Cycle Heat Rejection System

The cooling system for steam cycle heat rejection will consist of a surface condenser, circulating water system, and a wet cooling tower. The surface condenser will be a shell-and-tube heat exchanger with wet, saturated steam exhausted from the LP section of the STG condensing on the shell side and circulating water flowing through the tubes to provide cooling. The warmed circulating water will exit the condenser and flow to the evaporative cooling tower to be cooled and reused.

The mechanical draft cooling tower will employ electric motor-driven fans to move air through each cooling tower cell. The cascading circulating water will be partially evaporated, and the evaporated water will be dispersed to the atmosphere as part of the moist air leaving each cooling tower cell. Because of climatic conditions at the site, visible moisture plumes are expected to occur relatively infrequently and typically only in winter months. No need is expected for a plume-abated cooling tower.

Auxiliary Cooling Water System

The auxiliary cooling system provides cooling for equipment, including the STG and lube oil. The auxiliary cooling system includes a closed cooling water system that rejects heat to the cooling tower circulating water system. Heat is gathered from the equipment and rejected via a heat exchanger.

4.a.v.B) Source of Water

The CSP Project will require approximately 2400 acre-feet per year (AF/Y) of water on average, with approximately 2200 AF/Y required for cooling and boiler blowdown, 130 AF/Y for mirror washing, and the remainder for potable water, steam makeup, and general use.

The anticipated source for the majority of this water is effluent from the City of Kingman's Hilltop wastewater treatment plant (WWTP), located approximately 25 miles south of the Project.[1] Depending on the route selected, the effluent

[1] The WWTP presently produces about 1800 AF/Y of treated effluent that could be used by the Project. Within about a year, the City will complete an upgrade of this plant that will provide this water as a mixture of

pipeline will be 25 to 35 miles long. The effluent pipeline will be located in easements negotiated with the landowners or with the county.

The CSP Project is expected to have four on-site wells to provide potable water and possibly mirror washing water. These wells will be sized such that three of them can provide for the entire project water needs in the event that the supply of WWTP effluent is interrupted or becomes unavailable.

Table 4-1, Water Use lists flow rates and annual water uses for both an average year and a maximum use year. Usage rates will vary during the year and will be higher in the summer. Equipment sizing will be consistent with peak daily rates to ensure adequate design margins. **Exhibit B-1** provides a hydrogeological analysis based on the projected water use during the CSP Project's operating life.

Water for domestic uses by CSP Project employees will be provided by on-site groundwater and will be treated to potable water standards by a package treatment unit if necessary.

Groundwater well depths are in the range of 700 to 1,000 feet.

Preliminary ground water quality is shown in **Table 4-2, Groundwater Well Water Quality**.

Any unused wells located within the Project site will be taken out of service and closed in accordance with ADWR requirements.

4.a.vi) Proposed Height / Number of Stacks

The CSP Project is expected to have eleven (11) small stacks – one (1) associated with the auxiliary boiler and the other ten (10) associated with the HTF heaters. Each of these stacks will be approximately fifty (50) feet high.

4.a.vii) Dates for Scheduled Start-up / Operation

One primary construction contractor will perform the engineering, procurement, and construction (EPC) of the Project. The EPC contractor will be responsible for the final design of the Project; procurement of equipment (except for some owner-procured major equipment) and permanent materials; construction of all civil works, foundations and structures; and startup and testing of the generation facility.

A and B quality. It is anticipated that more existing users will tap into the sanitary sewer system when the upgrade is completed and capacity is increased, and that the City will continue to grow. These factors together could result in all of the Project's cooling water requirements being met by effluent from the WWTP within 3 years of beginning operation.

Construction of the CSP Project is scheduled to commence in the 4th quarter of 2010 and will take 2½ to 3 years, allowing the CSP Project to commence commercial operations in late-2013. The CSP Project will operate year-round.

The key schedule milestones are presented in **Table 4-3, Anticipated CSP Project Schedule**.

The anticipated monthly construction labor force requirements for the CSP Project are presented in **Figure 4-6, Construction Workforce Projection**. This projection includes all personnel required to complete construction of the CSP Project including overall site management, laborers, skilled craft, and startup personnel. Skilled craft and laborers will be drawn from the local area wherever possible, with construction management and startup functions provided (most likely) by relocated personnel from the EPC contracting firm.

4.a.viii) Estimated Costs of Facilities / Site

4.a.viii.A) Project Costs

The cost of the CSP Project is estimated to be $2.2 billion.

The cost includes the solar collectors, steam turbine generator, transformers, water, Gen-Tie interconnection facilities and all ancillary balance of equipment as well as all civil works, construction labor, construction materials, engineering, interest during construction, financing fees, utility deposits, insurance, and overhead.

4.a.viii.B) Site Costs

The cost of the land is included the total provide above.

4.a.ix) Legal Description of Proposed Site

The CSP Generating Facility is located entirely on private land. However, due to the checkerboard nature of the land in this area, both the access roads and Gen-Tie for the Project will need to cross some federal land that is administered by the BLM.

The private land for the Generating Facility includes Sections 19, 20, 21, 28, 29, 30, and the north half of Section 31 all within Township 26 North, Range 16 West, Gila and Salt River Baseline and Meridian.

4.a) PV Electric Generating Plant

4.a.i) Type of PV Generating Facility

If the Project ultimately uses PV technology, the PV Project will most likely utilize crystalline silicon or thin film PV technology on single-axis trackers, or fixed-tilt supports. Actual equipment will be similar to this technology, and will be selected based on cost and market availability of the equipment.

The PV modules are non-reflective and convert sunlight into DC electricity. The DC output of multiple rows of PV modules is collected through one or more combiner boxes and directed to an inverter. The inverter converts the DC electricity to AC electricity, which then flows to transformers within the Generating Facility, where the power is stepped up to transmission voltage.

The Gen-Tie will be identical for the CSP Project and the PV Project.

The major differences between the CSP Project and PV Project are further described in the following sections.

4.a.ii) PV Project Description

Based on the available site acreage and the technology option selected, at the highest instantaneous peak output, the PV Project will produce a maximum instantaneous electrical rating of 500 megawatts direct current (MWdc), which would represent about 375 to 425 megawatts alternating current (MWac), depending on the technology selected. Unlike a single source turbine generator that can maintain a relatively constant energy output over ranges of ambient conditions, the average annual capacity rating for a PV facility is a function of the DC to AC conversion that varies considerably with ambient temperature and solar insolation.

The PV Project's overall annual availability is expected to be in the range of 99 percent excluding non-daylight hours. The PV Project's annual energy production will range from 650,000 to 900,000 net megawatt hours (MWh ac) per year. Annual generation will depend on the PV technology selection, density of modules on the site, project availability, and the local solar insolation during that given year. Optimization of the peak rating and the annual energy production will be conducted during the detailed engineering and procurement phase of the PV Project.

4.a.ii.A) PV Project Site Layout and Arrangement

The proposed facility layout of the PV technology for the PV Project is shown on **Figure 4-7, PV General Layout.**

Most of the site will be disturbed by construction of the PV Project. Temporary construction lay down, construction trailers and parking areas will be provided within the Project site. Due to the size of the site, the solar field lay down area will be relocated periodically within the solar field as the solar field is built out.

4.a.ii.B) PV Solar System / Process

Photovoltaic panels will produce all of the electricity generated by the PV Project facilities. PV panels convert sunlight directly into a DC voltage. The major equipment includes the following:

- PV solar panels
- Single-axis trackers, or fixed-tilt supports
- Inverters
- Three phase pad mounted transformers and circuit breakers.

4.a.ii.C) PV Project Electrical System Description

The wiring from the solar panels delivers DC power along an underground trench or above ground conduit to the inverters located on the electrical equipment pads. The inverters convert the DC power to AC that is then stepped up to medium voltage via 480 Volt to 34.5kV transformers. The medium voltage transformers deliver power along an overhead collection system to the PV Project switchyard where the power is stepped up to transmission voltage for interconnection to the electrical grid.

The PV Project will have a Supervisory Control and Data Acquisition (SCADA) system that will allow for remote monitoring and control of inverters and other PV Project components. The SCADA system will be able to monitor PV Project output and availability, and to run diagnostics on the equipment.

Electrical System for Generating Facility Auxiliaries

During daylight hours, power for Generating Facility auxiliaries will be provided by the PV Project's electrical generation. During non-daylight hours, the PV Project will require small amounts of power from an external source for the O&M building, to keep transformers warm during non-daylight hours, to realign the trackers to the east at night so that they are properly oriented to catch the morning sun the following day, and for Generating Facility lighting and security. This power will be provided by either back feed from the electrical grid or from an on-site emergency generator (during grid outages). Power from the grid will be

stepped down to an appropriate voltage to support Generating Facility auxiliaries and will be connected to the station service power switchgear.

An emergency diesel powered firewater pump will provide power for fire protection in the event that power from the electrical grid is unavailable.

4.a.ii.D) PV Generating Facility Auxiliaries Description

The following subsections describe the various Generating Facility auxiliary systems associated with the PV Project.

During operations, approximately 30 acre feet of water per year will be required by the Generating Facility for domestic use, process water, and fire protection. Domestic use will include restrooms, showers, and other employee uses. Process water will be required for washing solar panels and maintenance uses. Water will be sprayed on the PV panels periodically to remove dust and contaminants to maintain efficient conversion of sunlight to electrical power. The cleaning interval will be determined by the rate at which electrical output degrades between cleanings and will vary depending upon weather conditions.

The PV Project would not use the effluent from the City of Kingman's Hilltop wastewater treatment plant due to the relatively small quantity of water required and high cost of the pipeline required to deliver that water. A single on-site raw water storage tank, with a nominal 10,000 gallon capacity, will provide raw water storage.

Fire Protection

Fire protection is generally the same for both the PV Project and the CSP Project and has been previously described in the CSP Section.

Plant Control System

The microprocessor-based Plant Control System (PCS) will provide control, monitoring, alarm, and data storage functions for plant systems as well as communication with the PV Solar Field SCADA system. Redundant capability will be provided for critical PCS components so that no single component failure will cause a facility outage.

All field instruments and controls will be hard-wired to local electrical panels. Local panels will be hard-wired to the plant PCS system. Wireless technology will be reviewed as a potential alternative during final PV Project design.

Compressed Air

The PV Project will have a small service air system located in the O&M building to operate small hand tools. One or more commercial grade air compressors will be provided for the Project.

Lighting System

The PV Project's lighting system will provide operation and maintenance personnel with illumination for both normal and emergency conditions. Lighting will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be downward facing and shielded to focus illumination on the desired areas only. There will be no lighting in the solar field, so light trespass on surrounding properties will be minimal. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting will be used.

Roads, Fencing, and Security

A small portion of the overall PV Project site will be paved, including the site access road, parking area, and portions of the area around the O&M building. The PV solar field and support facilities perimeter will be secured with security fencing with controlled access as described for the CSP Project.

Site Drainage and Earthwork

Grading of the Project site will be required as described for the CSP Project.

4.a.ii.I.D) PV Project Auxiliary Electrical System

Power for the auxiliary system will be provided by the PV Project during the day and back fed from the grid when the Generating Facility is not operating. In either case the power will be stepped down to an appropriate voltage (typically 480V) to support Generating Facility auxiliaries and will be connected to the station service power switchgear.

A DC power supply and an essential service AC system will provide power to ensure that critical safety and equipment protection control circuits are always energized and able to function in the event of unit trip or loss of AC power. The battery bank is sized to power the DC loads and essential service AC loads through an inverter for a sufficient amount of time to provide for safe and damage-free shut down of the power plant.

4.a.ii.D.i) Grounding

The electrical system is susceptible to ground faults, and lightning and switching surges that can pose hazards to site personnel and electrical equipment. The

station grounding system provides an adequate path to ground to permit the dissipation of current created by these events. The station-grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentration.

4.a.ii.E) PV Operations

O&M activities associated with a PV Project are minimal. Long-term maintenance schedules will be developed to include periodic maintenance and equipment replacement in accordance with manufacturer recommendations.

No heavy equipment will be used during normal PV Project operation. Operation and maintenance vehicles will include trucks, forklifts, and loaders for routine and unscheduled maintenance, and water trucks for solar panel washing. Large heavy-haul transport equipment may be brought to the site infrequently for equipment repair or replacement.

4.a.ii.F) PV Site Access and Transportation

Access to the PV Project site and the transportation of personnel and materials will be the same as that described for the CSP Project.

4.a.iii) PV Project Source / Type of Fuel

The PV Project is fueled by solar energy and only a very small quantity of fossil fuel would be used to heat the O&M building. The fuel will be stored in a bulk storage tank onsite and will be filled regularly by a local supplier.

4.a.iv) PV Project Amount of Fuel Utilized

The PV Project would be expected to utilize an insignificant amount of fossil fuel per year.

4.a.v) PV Project Type of Cooling / Source of Water

If the PV Project is developed, it would not require a cooling process and, therefore, no water for cooling.

4.a.vi) PV Project Proposed Height / Number of Stacks

The PV Project would not have any stacks.

4.a.vii) PV Project Dates for Scheduled Start-up / Operation

The schedule for the PV Project is similar to the description in the CSP Project description.

4.a.viii) PV Project Estimated Costs of Facilities / Site

4.a.viii.A) PV Project Costs

The cost of the PV Project is estimated to be approximately $1.75 billion. The cost includes the PV panels, electric transmission interconnection facilities, and all ancillary balance of plant equipment as well as all civil works, construction labor, construction materials, and engineering.

4.b.viii.B) Site Costs

The cost of the Property is the same as described for the CSP project.

4.a.ix) Legal Description of Proposed Site

The legal description for the PV Project site is the same as that described for the CSP Project.

4.b) Electrical Interconnection

The electrical interconnection is the same for both the CSP Project and the PV Project.

4.b.i) Nominal Voltage

The Project interconnection voltage is 500kV or 345kV. The one-line diagram of the Project for the 500kV interconnection is shown on **Figure 4-4**.

4.b.ii) Description of Endpoints

Interconnection #1

Interconnection #1 termination is approximately 2 miles north of the solar field located entirely in Township 26 North, Range 16 West. The termination would be located in the northeast corner of Section 09, on private land. The Gen-Tie alignment for Interconnection #1 is depicted on **Figure 4-8**.

The Interconnection #1 Gen-Tie alignment would run as follows:

- from the Generating Facility's Power Block to the property boundary; then
- north for 1.25 miles within a 1320-foot wide corridor from the property boundary along the east boundary of Section 17 (private property) and 08 (BLM land); then

- north for 1.25 miles within a 1320-foot wide corridor along the west boundary of Section 16 (BLM land) and Section 09 (private property) until it reaches the north boundary of Section 09; then
- east for about 0.75 miles within a 1320-foot wide corridor along the north boundary of Section 09 (private property) until it reaches the termination.

Interconnection #1 is approximately 2.75 miles in length from the property boundary and has a total ROW acreage of 66.7 acres.

Interconnection #2

Interconnection #2 termination is approximately 6 miles north of the solar field and is located in the northeast corner of Section 25 of Township 27 North, Range 17 West on private land. The Gen-Tie alignment for Interconnection #2 is depicted on **Figure 4-8**.

The Interconnection #2 Gen-Tie alignment would run as follows:

- from the Generating Facility's Power Block to the property boundary; then
- north for 1.25 miles within a 1320-foot wide corridor from the property boundary along the east boundary of Section 17 (private property) and 08 (BLM land); then
- north for 1.25 miles within a 1320-foot wide corridor along the west boundary of Section 16 (BLM land) and Section 09 (private property) until it reaches the north boundary of Section 09; then
- north for one mile within a 1320-foot wide corridor through Section 04 until it reaches the west boundary of the existing transmission line corridor, which it will parallel on a generally northwest heading;

and from there, it will run within a 2640-foot wide corridor measured from the centerline of the Mead-Liberty transmission line west of and parallel to the existing transmission line for approximately 3.5 miles:

- through the northeast corner of Section 05 in Township 26 North, Range 16 West (BLM land);
- through Sections 32, 31, and 30 in Township 27 North, Range 16 West (BLM land);
- through Sections 25 (private land) and 24 (BLM land) in Township 27 North, Range 17 West; and
- terminate in Section 23 (private property) in Township 27 North, Range 17 West.

Interconnection #2 is approximately 6.5 miles in length from the Generating Facility boundary and has a total ROW acreage of 157.6 acres.

4.b.iii) Right-of-Way Width

The Gen-Tie will be located along the centerline of a 200-foot wide ROW. It will be built to utility standards as required by Western and the ACC to ensure reliability and to match the existing lines.

4.b.iv) Estimated Costs

The costs for the Gen-Tie are included in the overall Project costs provided in section 4.a.viii above.

4.b.v) Description of Proposed Route and Switchyard Locations

This is provided in the section 4.b.ii s above.

4.b.vi) Ownership Percentages of Land Traversed by the Route

Interconnection # 1 is approximately 97% on private land and 3% on public land. Interconnection #2 is approximately 30% on private land and 70% on public land.

5. List the areas of jurisdiction [as defined in A.R.S. § 40-360(1)] affected by each alternative site or route and designate those proposed sites or routes, if any, which are contrary to the zoning ordinances or master plans of any of such areas of jurisdiction.

The Project site and surrounding area falls under the jurisdiction of Mohave County and BLM. The majority of Interconnection #2 is within a BLM-dedicated utility corridor.

The Project site is currently under a Rural Development Area (RDA) land use designation. In November 2009, Mohave County Planning and Zoning Commission and the Board of Supervisors unanimously approved a Major Amendment to the Mohave County General Plan for the Project site to change the land use designation from a RDA land use designation to an RDA, RI (Rural Development Area, Rural Industrial) land use designation.

6. Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to

be performed in such connection, including the contemplated date of completion.

The Project is subject to NEPA compliance for two reasons; first, because the generation is planned to interconnect with federal electric transmission line system managed by the Western and second, because the Gen-Tie, the access road, and possibly, a wastewater effluent pipeline[2] will cross Public Land managed by the BLM. NEPA compliance has been initiated and an EIS is being prepared. Western is the Lead federal agency and the BLM is a Cooperating agency. A NEPA document, although underway, is not complete and therefore not included in the application.

The Project has concluded the federal scoping phase and resource studies are being prepared. A complete copy of the Draft Scoping Report is contained in **Exhibit J-2.**

Contained in **Exhibit B-1** and **Exhibit B-2** are reports prepared for Hydrogeology & Water Quality, and Air Quality, respectively.

[2] The Project is pursuing the purchase of effluent from the City of Kingman's wastewater treatment facility to use as replacement for groundwater, and is analyzing routing options to bring that effluent to the Project site by pipeline.

By: _____
Authorized Officer

ORIGINAL and 25 copies of the foregoing hand delivered and filed with the Director of Utilities, Arizona Corporation Commission, this 23RD day of November, 2009.

Table 4-1 CSP Water Use				
	Average Year		**Maximum Year**	
	Total	**Flow Rate**	**Total**	**Flow Rate**
Project Component	*AF*	*gpm*	*AF*	*gpm*
Cooling Towers (CT)	2,115	1,312	2,644	1,640
CT Blowdown (non-recyclable)	89	54	111	67
Steam Makeup	57	71	72	89
Mirror Washing	130	81	162	101
Potable Water	4	2	4	3
Service (cleaning, etc.)	14	9	18	11
Total	**2,409**	**1,734**	**3,011**	**1,910**

Average Flows based on generation from Typical Meteorological Year
Maximum Year based on 25% increase above average

Table 4-2 Groundwater Well Water Quality

Well Name:		RL-1	RL-2	PH-1	PH-A
ADWR Well Identifier:		55-086253	55-640651	55-903621	55-904410
Cadastral Location:		(B-26-17)	(B-27-17)	(B-22-15)	(B-22-15)
		23CDD	23CAC	19CBB	33BBB
Latitude		35.6191	35.7107	35.2752	35.2525
Longitude:		114.0696	114.0719	113.9219	113.8857
Date Sampled:		12/30/2005	1/13/2006	2/2/2006	3/27/2006
Screened Interval:		257 - 740	400 - 603	729 - 1,480	746 - 1,483
Water Level (feet, bls) / Date Measured:		259 / 12-17-05	367 / 12-17-05	623 / 1-25-06	849 / 4-12-06
	UNITS				
FIELD PARAMETERS:					
Temperature	deg C	29	31.4	31	27.5
pH	std units	8.77	8.54	8.00	8.50
Electrical Conductivity (EC)	µS/cm	1,545	855	342	425
LAB RESULTS:					
Antimony (Sb)	mg/L	<0.0030	<0.0030	<0.0020	<0.025
Arsenic (As)	mg/L	<0.0040	<0.0040	0.0033	0.0170
Barium (Ba)	mg/L	0.035	0.120	0.034	0.110
Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0002	<0.0010
Cadmium (Cd)	mg/L	<0.0030	<0.0030	<0.0020	<0.0030
Chromium (Cr)	mg/L	0.089	0.022	0.0331	<0.010
Copper (Cu)	mg/L	<0.010	<0.010	0.0037	<0.010
Iron (Fe)	mg/L	<1.0	<0.10	<0.10	1.7
Lead (Pb)	mg/L	<0.0030	<0.0030	<0.0020	<0.010
Manganese (Mn)	mg/L	0.025	<0.010	0.0045	0.076
Mercury (Hg)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (Ni)	mg/L	<0.010	<0.010	<0.0020	<0.010
Selenium (Se)	mg/L	<0.0030	<0.0030	<0.0020	<0.010
Thallium (Tl)	mg/L	<0.0020	<0.0020	<0.0002	
Calcium (Ca)	mg/L	43	10	22.0	24
Magnesium (Mg)	mg/L	<10	8.8	10.0	7.5
Potassium (K)	mg/L	<20	4.8	3.1	3.9
Sodium (Na)	mg/L	250	160	40	---
Cyanide (CN)	mg/L	0.013	<0.010	<0.010	---
Silica (SiO_2)	mg/L	19	18	27	31
Chloride (Cl)	mg/L	820	110	12	25
Fluoride (F)	mg/L	2.8	1.1	1.7	3.2
Sulfate (as SO_4)	mg/L	41	51	14	22
Nitrate (NO_3 - as N)	mg/L	2.5	2.7	1.2	1.2
Nitrite (NO_2 - as N)	mg/L	<0.020	<0.020	<0.020	<0.020
Bicarbonate (HCO_3 as $CaCO_3$)	mg/L	68	190	130	150
Carbonate (CO_3 as $CaCO_3$)	mg/L	<20	<20	<20	<20
Hydroxide (OH as $CaCO_3$)	mg/L	<20	<20	<20	<20
Total Alkalinity (Alk as $CaCO_3$)	mg/L	72	190	130	150
pH	std units	8.3	8.2	8.2	8.4
Temperature	deg C	14.7	22.9	22.7	23.5
Hardness, Calcium (Hard)	mg/L	110	26	56	59
Specific Conductance (EC)	µS/cm	---	---	---	410
Total Dissolved Solids (TDS)	mg/L	830	490	200	250
Gross Alpha Activity (Alpha)	pCi/L	2.0 ± 0.7	10.9 ± 1.8	9.1 ± 1.5	---
Langlier Index		0.025	-0.065	0.037	---
Total Coliform (Coliform)		Not Detected	Detected	Not Detected	---
Escherichia Coli		Not Detected	Not Detected	Not Detected	---
Asbestos	mf/L	<2.6	<0.2	<0.2	---
ADEQ Required New Source					---
Organic Compounds	µg/L	Not Detected	Not Detected	Not Detected	---

Abbreviations: deg C = degrees Celsius; mg/L = milligrams per liter; µS/cm = microSiemens per centimeter; pCi/L = picoCuries per liter; std units = standard units; mV = millivolts; mf/L = million fibers per liter; µg/L = micrograms per liter

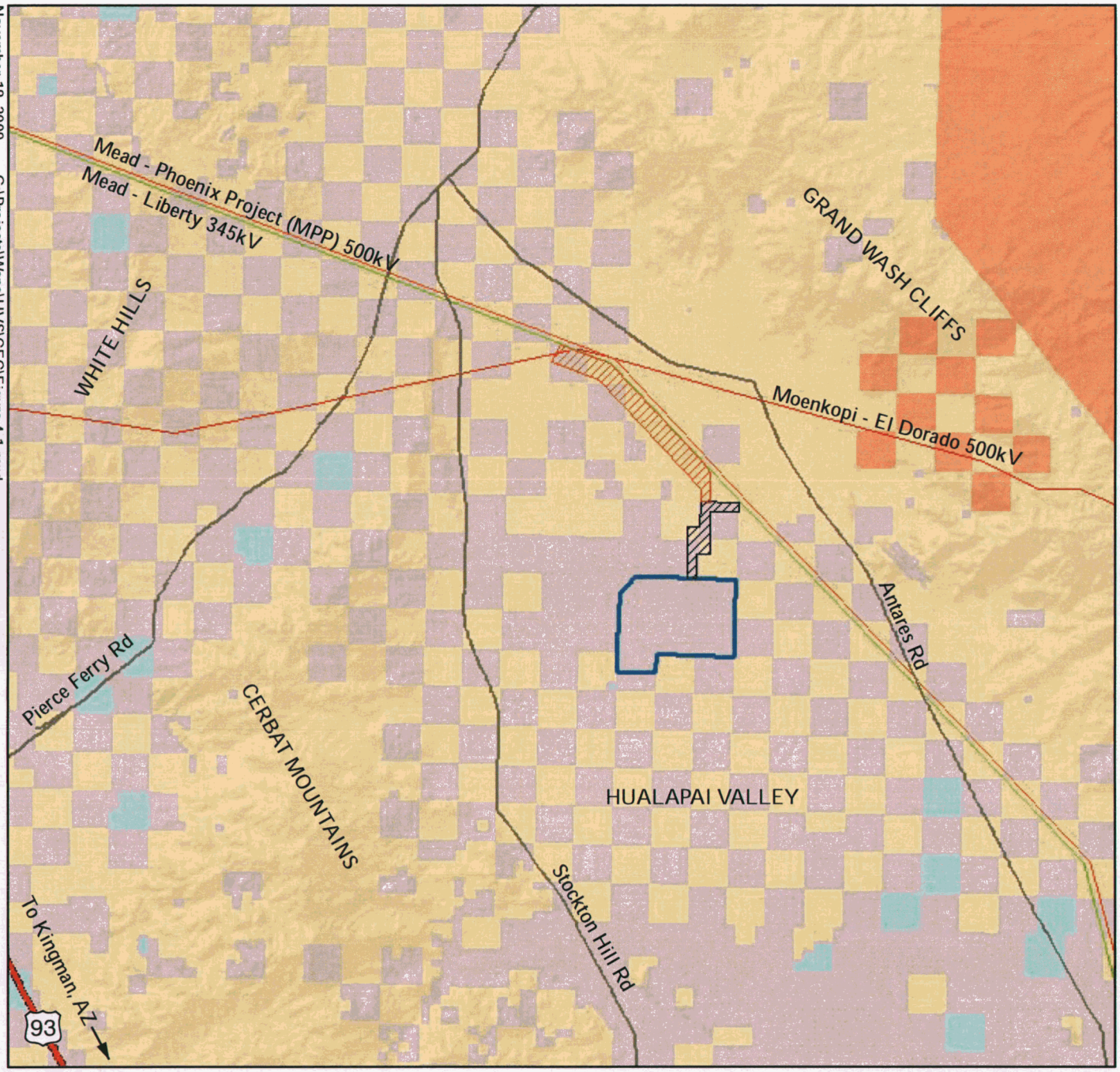
Source: M&A (2006)

P:\1326\WQ Assessment\Table 01_Lab Results.xls

MONTGOMERY & ASSOCIATES

Table 4-3 Anticipated CSP Project Schedule		
Activity	**Start Date**	**End Date**
Obtain CEC Permit	Aug-2009	Mar-2009
Material Construction Permits	Apr-2009	Oct-2009
Order Major Equipment	Dec-2010	Dec-2011
Start On-Site Construction (early)	Dec-2010	Dec-2010
Commercial Operation (early)	Jun-2013	Jun-2013

November 18, 2009 G:\Projects\Wapa\HVS\CEC\Figure 4-1.mxd



Legend

- Solar Facility
- Interconnection #1 Gen-Tie
- Interconnection #2 Gen-Tie

Ownership

- BLM
- Hualapai Indian Reservation
- Private
- State Trust

N

1:250,000

0 5 Miles

Ownership information from ALRIS (2006)

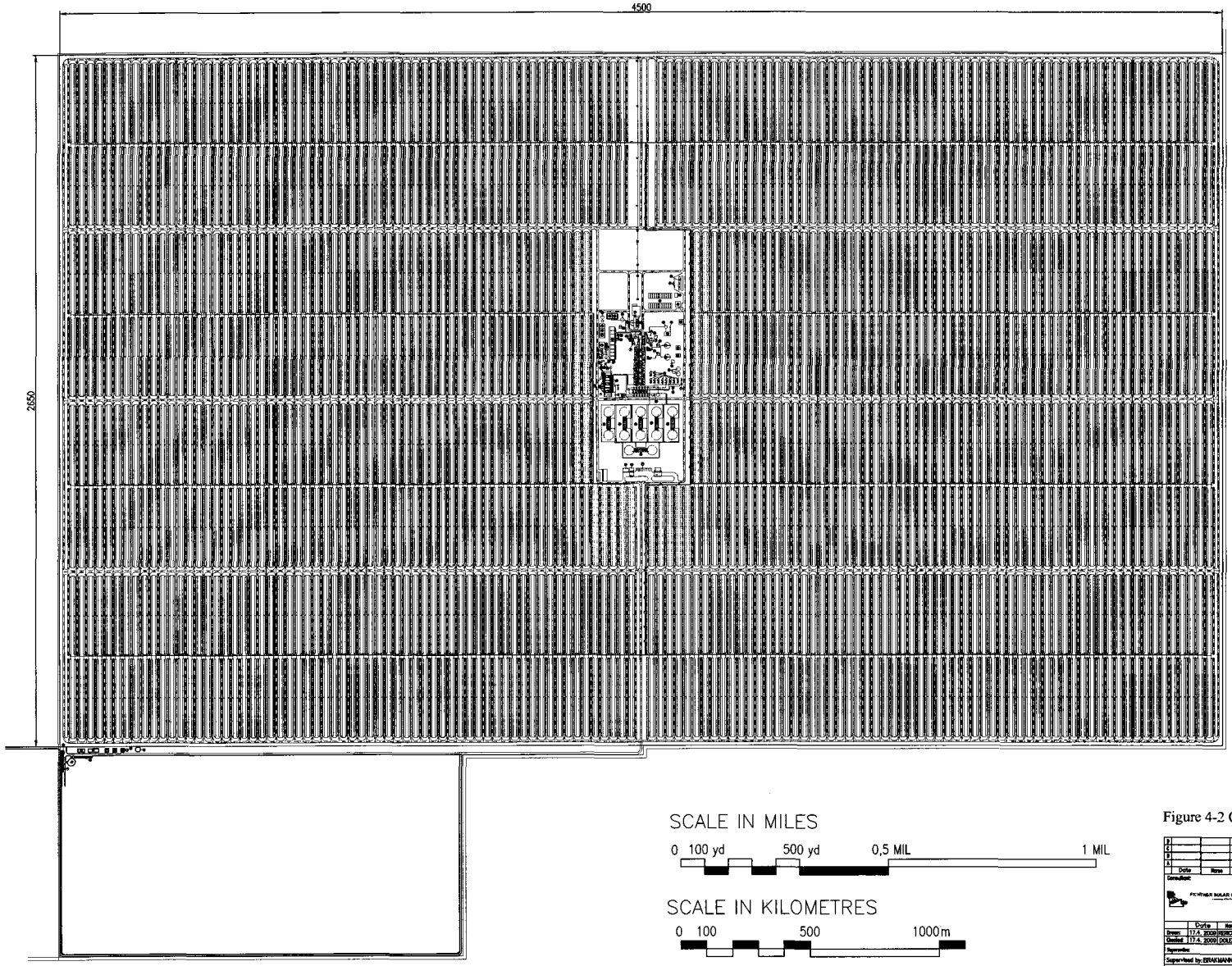
Project Area

Hualapai Valley Solar Project

Figure 4-1

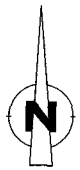
hualapai valley solar™
a mohave sun power project

TRANSCON ENVIRONMENTAL



1. Steam Turbine / Generator
2. Feedwater Pumps
3. Solar Steam Generator
4. Preheaters
5. Deaerator / Storage Tank
6. Intermittent Blowdown Tank / Continuous Blowdown Tank
7. Condenser
8. Condensate Pumps
9. Auxiliary Boiler
10. Cooling Towers
11. Cooling Tower Chemical Feed / Storage
12. Cooling Tower Water Pumps
13. Cooling Water Circulation Pumps
14. Cooling Tower Electrical Building
15. Sodium Hypochloride
16. Sulfuric Acid Storage Tank
17. Cooling Tower Make-Up Water Pumps
18. Service Water Pumps
19. Water Treatment Building
20. Service and Fire Water Tank
21. Service Water Storage Tank
22. PG – Water Tank
23. Demi Water Tank
24. Firewater Pump House
25. Filling Station Demi Water for Mirror Washing
26. Brine Buffer Tank
27. Brine Pretreatment
28. Brine Treatment
29. Water Pretreatment
30. Sludge Treatment
31. GSU Transformer
32. SUS Transformer
33. Switchyard
34. Switchgear 1
35. Switchgear 2
36. Switchgear 3
37. Nitrogen System
38. HTF Storage Tank
39. HTF Expansion Vessels
40. HTF Overflow Tanks
41. HTF Heater
42. HTF Main Pumps
43. HTF Freeze Protection Pumps
44. HTF Solar Field Circulation Pump
45. HTF Ullage Cooler 1
46. HTF Ullage Cooler 2
47. Reclamation Drain Vessel
48. Ullage Discharge Pumps
49. HTF Filter
50. Reclamation Flush Vessel
51. Ullage Circulation Pumps
52. Drain Pumps
53. Ullage Vessels
54. Ullage Drain Vessel
55. Thermal Energy Storage 1
56. Thermal Energy Storage 2
57. Thermal Energy Storage 3
58. Thermal Energy Storage 4
59. Thermal Energy Storage 5
60. Thermal Energy Storage 6
61. Admin Building / Control Room
62. Warehouse, Workshop
63. Neutralization Storage Tank
64. Bisulfite Storage Tank
65. Scale Inhibitor Storage Tank
66. Chemical and Hazardous Material Storage
67. Sodium Hydroxide Storage Tank
68. Truck Washing
69. Petrol Station
70. Diesel Generator
71. Mirror Washing Truck Parking
72. Toilet
73. Gate House
74. Visitor Centrum
75. Dressing Rooms
76. Canteen and Temporary Offices
77. First Aid Rooms
78. Fire Station
79. Potable Water Treatment
80. Drink Water Reservoir
81. Raw Water Tank
82. Visitors' Park Places
83. Employees' Park Places

COMPASS DIRECTION



SCALE IN MILES

0 100 yd 500 yd 0,5 MIL 1 MIL

SCALE IN KILOMETRES

0 100 500 1000m

Figure 4-2 CSP Project Layout

Date	Name	Note

Consultant: FICHTNER SOLAR GmbH

Client: Hualapai Valley Solar, LCC

GENERAL LAYOUT (RED LAKE)
NET ELECTRIC POWER 340 MWE
Range of thermal storage at full load 7,5 hours

Scale:

Sheet: 1 of 1

	Date	Name
Drawn:	17.4. 2009	PERCHA
Checked:	17.4. 2009	DOLGES

Supervisor:

Supervised by: BRAKMANN

Size: A2 | Project No.: | File: (DRAWING NAME)

System: AUTOCAD 2004 | Annex: | Document No.: P26.2009

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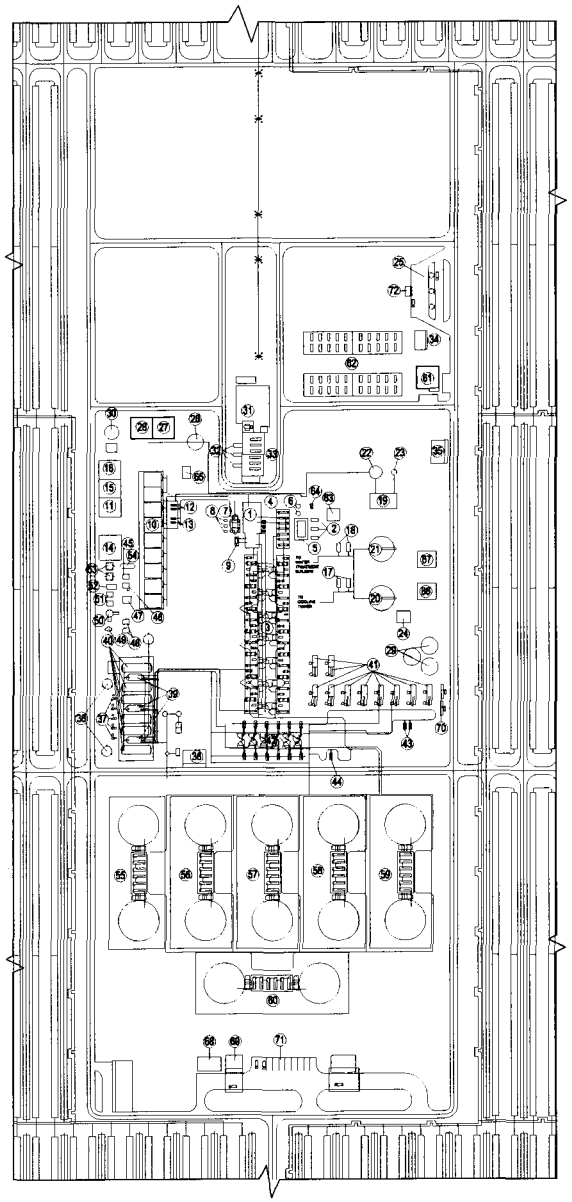
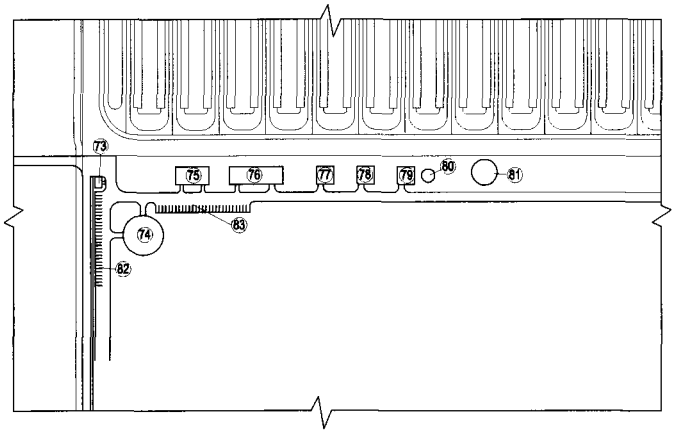
POWER BLOCK



NON PLANT BUILDING AREA



1. **Steam Turbine / Generator**
2. Feedwater Pumps
3. Solar Steam Generator
4. Preheaters
5. Deaerator / Storage Tank
6. Intermittent Blowdown Tank / Continuous Blowdown
7. Condenser
8. Condensate Pumps
9. Auxiliary Boiler
10. Cooling Towers
11. Cooling Tower Chemical Feed / Storage
12. Cooling Tower Water Pumps
13. Cooling Water Circulation Pumps
14. Cooling Tower Electrical Building
15. Sodium Hypochloride
16. Sulfuric Acid Storage Tank
17. Cooling Tower Make-Up Water Pumps
18. Service Water Pumps
19. Water Treatment Building
20. Service and Fire Water Tank
21. Service Water Storage Tank
22. RO – Water Tank
23. Demi Water Tank
24. Firewater Pump House
25. Filling Station Demi Water for Mirror Washing
26. Brine Buffer Tank
27. Brine Pretreatment
28. Brine Treatment
29. Water Pretreatment
30. Sludge Treatment
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36. Switchgear 3
37. Nitrogen System
38. HTF Storage Tank
39. HTF Expansion Vessels
40. HTF Overflow Tanks
41. HTF Heater
42. HTF Main Pumps
43. HTF Freeze Protection Pumps
44. HTF Solar Field Circulation Pump
45. HTF Ullage Cooler 1
46. HTF Ullage Cooler 2
47. Reclamation Drain Vessel
48. Ullage Discharge Pumps
49. HTF Filter
50. Reclamation Flash Vessel
51. Ullage Circulation Pumps
52. Drain Pumps
53. Ullage Vessels
54. Ullage Drain Vessel
55. Thermal Energy Storage 1
56. Thermal Energy Storage 2
57. Thermal Energy Storage 3
58. Thermal Energy Storage 4
59. Thermal Energy Storage 5
60. Thermal Energy Storage 6
61. Admin Building / Control Room
62. Warehouse, Workshop
63. Neutralization Storage Tank
64. Bisulfite Storage Tank
65. Scale Inhibitor Storage Tank
66. Chemical and Hazardous Material Storage
67. Sodium Hydroxide Storage Tank
68. Truck Washing
69. Petrol Station
70. Diesel Generator
71. Mirror Washing Truck Parking
72. Toilet
73. Gate House
74. Visitor Centrum
75. Dressing Rooms
76. Canteen and Temporary Offices
77. First Aid Rooms
78. Fire Station
79. Potable Water Treatment
80. Drink Water Reservior
81. Raw Water Tank
82. Visitors' Park Places
83. Employers' Park Places

Figure 4-3 Power Block

D			
C			
B			
A			
	Date	Name	Note

Consultant: FICHTNER SOLAR GmbH

Client: Hualapai Valley Solar, LLC

	Date	Name
Drawn:	17.4.2009	REICHN
Checked:	17.4.2009	DOLJAN
Superviser:		
Supervised by:	BRAKMANN	

SHORT CUT OF GENERAL LAYOUT (RED LAKE)
NET ELECTRIC POWER 340 MWE
Range of thermal storage at full load 7,5 hours

Scale:
Sheet: 1 of 1

Size: A2 | Project No.: | File: [illegible]

System: AUTOCAD 2004 | Annex: | Document No.: P26.2009

THIS CAD DRAWING MAY ONLY BE ALTERED WITH A CAD SYSTEM

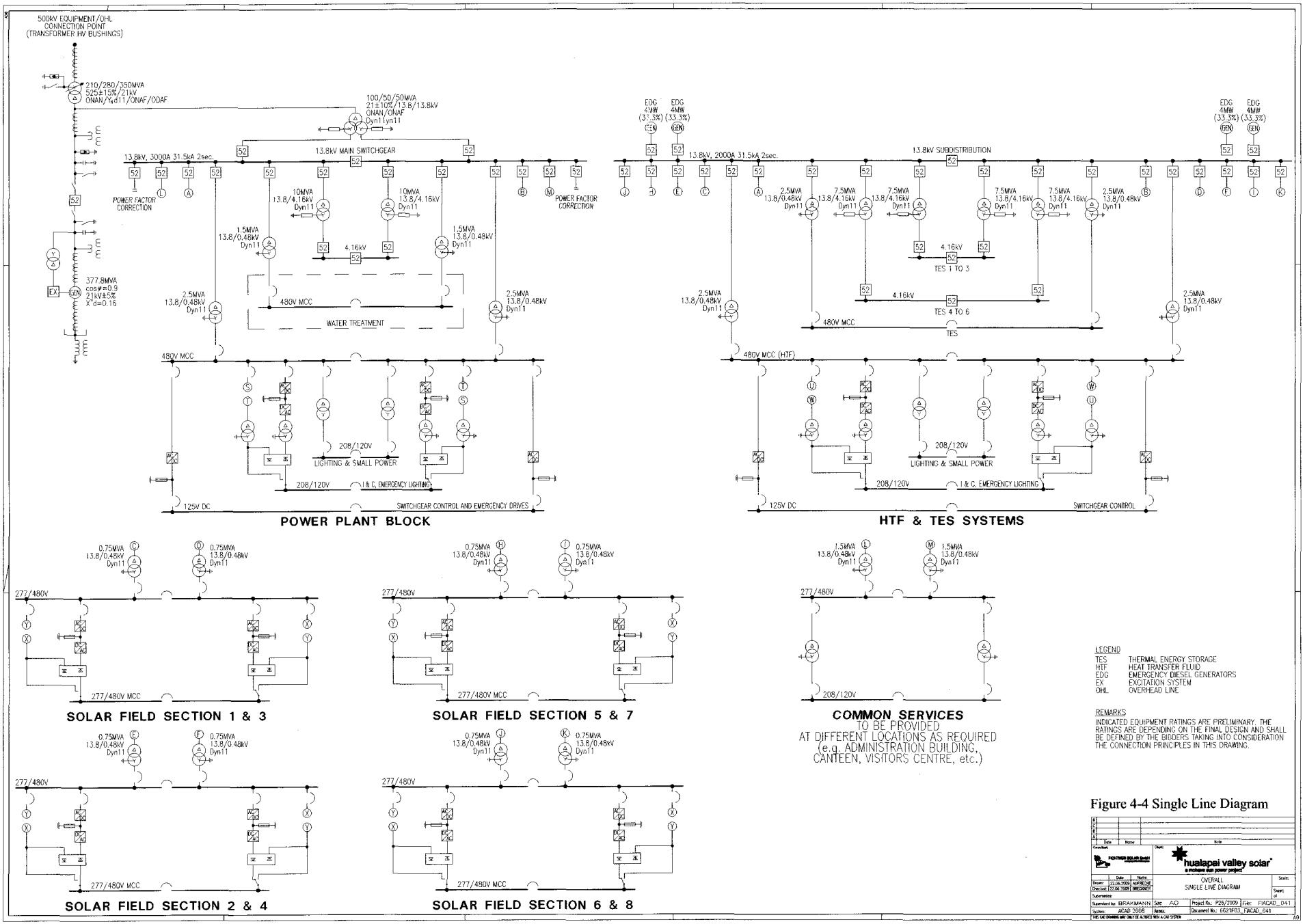
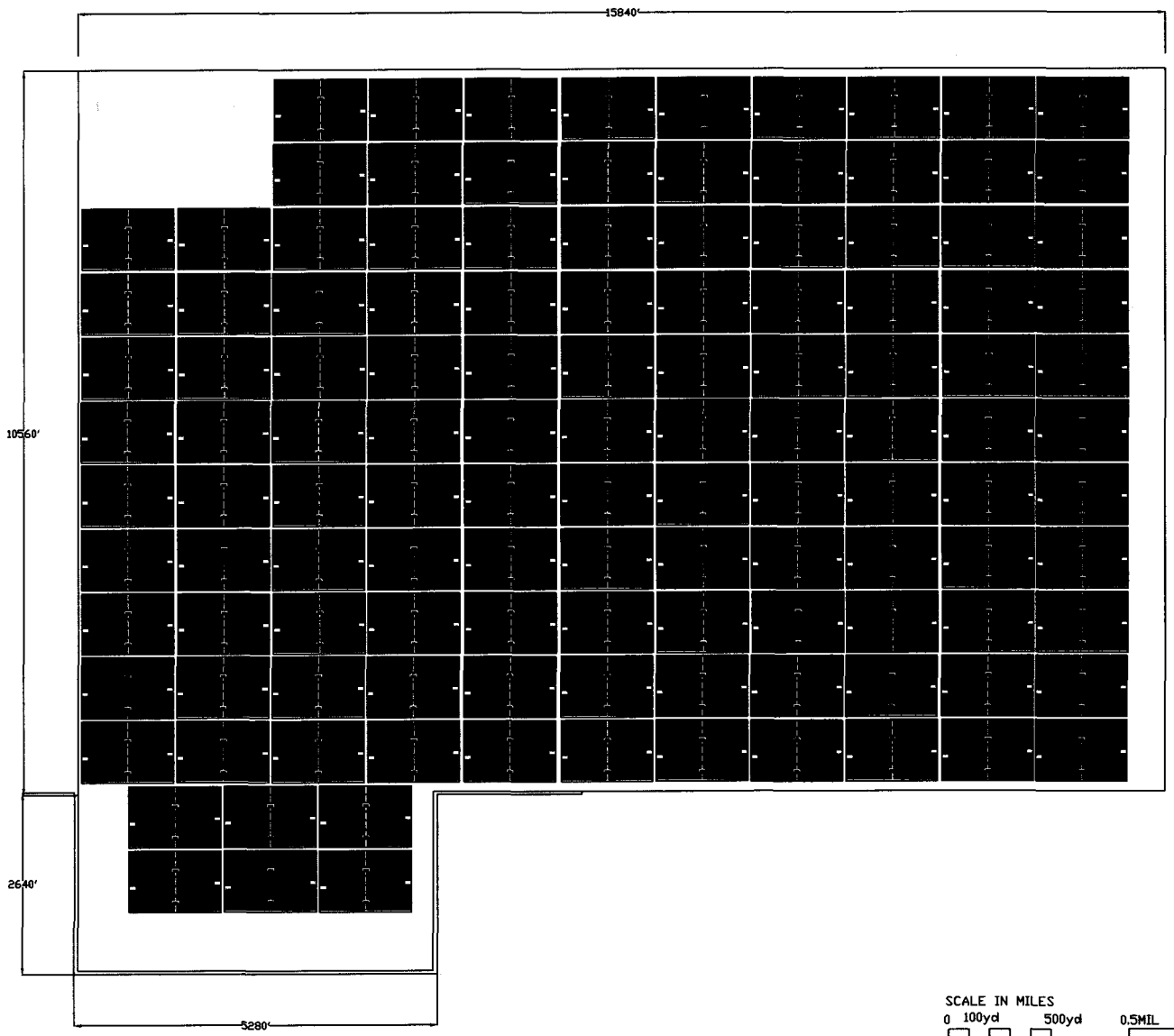
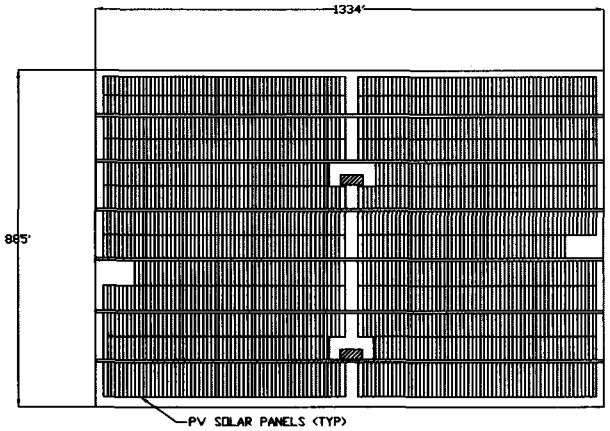


Figure 4-4 Single Line Diagram

Figure 4-5 Drainage Layout





DETAIL 1

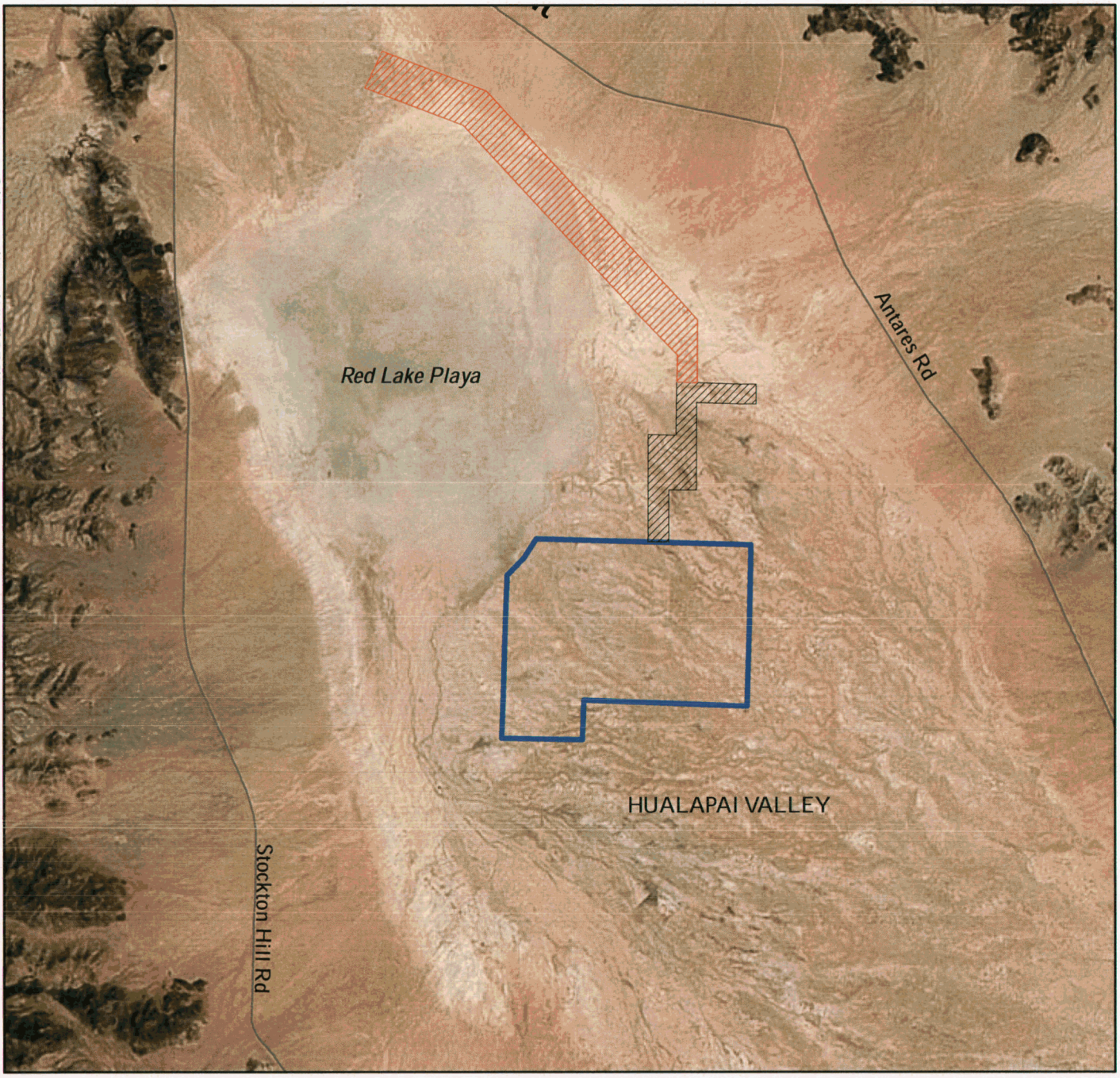
SCALE IN MILES

0 100yd 500yd 0.5MIL 1 MIL

Figure 4-7 PV General Layout

Consultant: Sigma Consultants, Inc.	Client: Haulapai Valley Solar, LLC	Scale: Sheet 1 of 1
DATE: 11.12.2009	GENERAL LAYOUT (PHOTOVOLTAIC ARRAY)	
DRAWN BY: BUTAY		
SUPERVISED BY: LARDW		
SYSTEM: AutoCAD LT	Project No:	File: PhotoVoltaic_SitePlan_HVS

November 17, 2009 G:\Projects\Wapa\HVS\CEC\Figure 4-8.mxd



Legend

- Solar Facility
- Interconnection #1 Gen-Tie
- Interconnection #2 Gen-Tie

N

1:120,000

0 2 Miles

Substation and Transmission Line Facilities

Hualapai Valley Solar Project

Figure 4-8

hualapai valley solar™
a mohave sun power project

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List of Acronyms

Alternating current (AC)
Aluminum Conductor Steal Reinforced (ACSR)
Arizona Corporation Commission (ACC)
Arizona Department of Environmental Quality (ADEQ)
Arizona Game and Fish (AGF)
Arizona State Historic Preservation Office (SHPO)
Arizona State Museum (ASM)
Aquifer Protection Permit (APP)
Best Available Management Practices (BMP)
Bureau of Land Management (BLM)
Comprehensive Plan Amendment (CPA)
Concentrating Solar Power (CSP)
Direct Current (DC)
Disodium Phosphate (DSP)
Distributed Control System (DCS)
Draft Environmental Impact Statement (DEIS)
Engineering, Procurement, and Construction (EPC)
Environmental Impact Statement (EIS)
Gallons Per Day (GPD)
Gallons Per Minute (GPM)
Generator step-up transformer (GSUT)
Heat Collection Elements (HCE)
Heat Transfer Fluid (HTF)
Illuminating Engineering Society (IES)
Institute of Electrical and Electronic Engineers (IEEE)
Intermediate Step-up Transformer (IST)
KiloVolts (kV)
Leak Collection and Recovery System (LCRS)
Local Area Network (LAN)
Low Pressure (LP)
Megawatts (MW)
Millions Gallons per Day (MGD)
National Environmental Policy Act (NEPA)
Off Highway Vehicles (OHV)
Operation and Maintenance (O&M)
Planned Area Development (PAD)
Photovoltaic (PV)
Prevention Significant Deterioration (PSD)
Solar Collector Assemblies (SCA)
Solar Steam Generator (SSG)
Station Service Transformers (SSTs)
Steam Turbine Generator (STG)
Supervisory Data Acquisition and Control (SCADA)
Thermal Energy Storage (TES)

Total Dissolved Solids (TDS)
Trisodium Phosphate (TSP)
Underwriter's Laboratories/Factory Mutual Research Corp (UL/FM)
Unit Auxiliary Transformer (UAT)
United States Fish and Wildlife Service (USFWS)
Volt (V)
Visual Resource Management (VRM)

EXHIBIT A - PROJECT LOCATION AND LAND USE

As stated in Arizona Administrative Code R14-3-219:

> *Where commercially available, a topographic map, 1:250,000 scale, showing the proposed plant site and the adjacent area within 20 miles thereof. If application is made for alternative plant sites, all sites may be shown on the same map, if practicable, designated by applicant's order of preference.*
>
> *Where commercially available, a topographic map, 1:62,500 scale, or each proposed plant site, showing the area within two miles thereof. The general land use plan within this area shall be shown on the map, which shall also show the areas of jurisdiction affected and any boundaries between such areas of jurisdiction. If the general land use plan is uniform throughout the area depicted, it may be described in the legend in lieu of an overlay.*

Figure A-1 depicts the Project site and jurisdictions within a 20-mile area on a topographic map (1:250,000 scale).

Figure A-2 depicts the Project site and jurisdiction within 2 miles on a topographic map (1:62,500 scale).

Figure A-3 depicts existing land use within a 2-mile radius of the Project site on aerial photograph (1:62,500 scale).

Project Location

The HVS Project is located in Mohave County, approximately 27 miles north of Kingman, Arizona and 80 miles southeast of Las Vegas, Nevada (see **Figure A-1**).

Jurisdiction/Ownership

Land use within the Project site and surrounding area falls under the jurisdiction of Mohave County and BLM.

The Generation Facility (approximately 6.5 square miles in area) will be located entirely on private property (see **Figure A-2**). The Project will require a butterfly crossing of BLM lands for the Gen-Tie as well as a butterfly crossing of BLM land for its access road.

Land Use and Zoning

The Project is currently under a Rural Development Area (RDA) land use designation (see **Figure A-3**). In September 2009, the Mohave County Planning and Zoning Commission unanimously approved a Major Amendment to the Mohave County General Plan for the Project site to change the land use designation from a RDA land use designation to an RDA, RI (Rural Development Area, Rural Industrial) land use designation.

The Major Plan Amendment was granted by the Mohave County Board of Supervisors on November 16, 2009.

The County is currently reviewing the zoning requirements for solar developments in Mohave County. Once the zoning requirements are approved, the Project will apply for appropriate zoning permits, if required.

Potential Effects

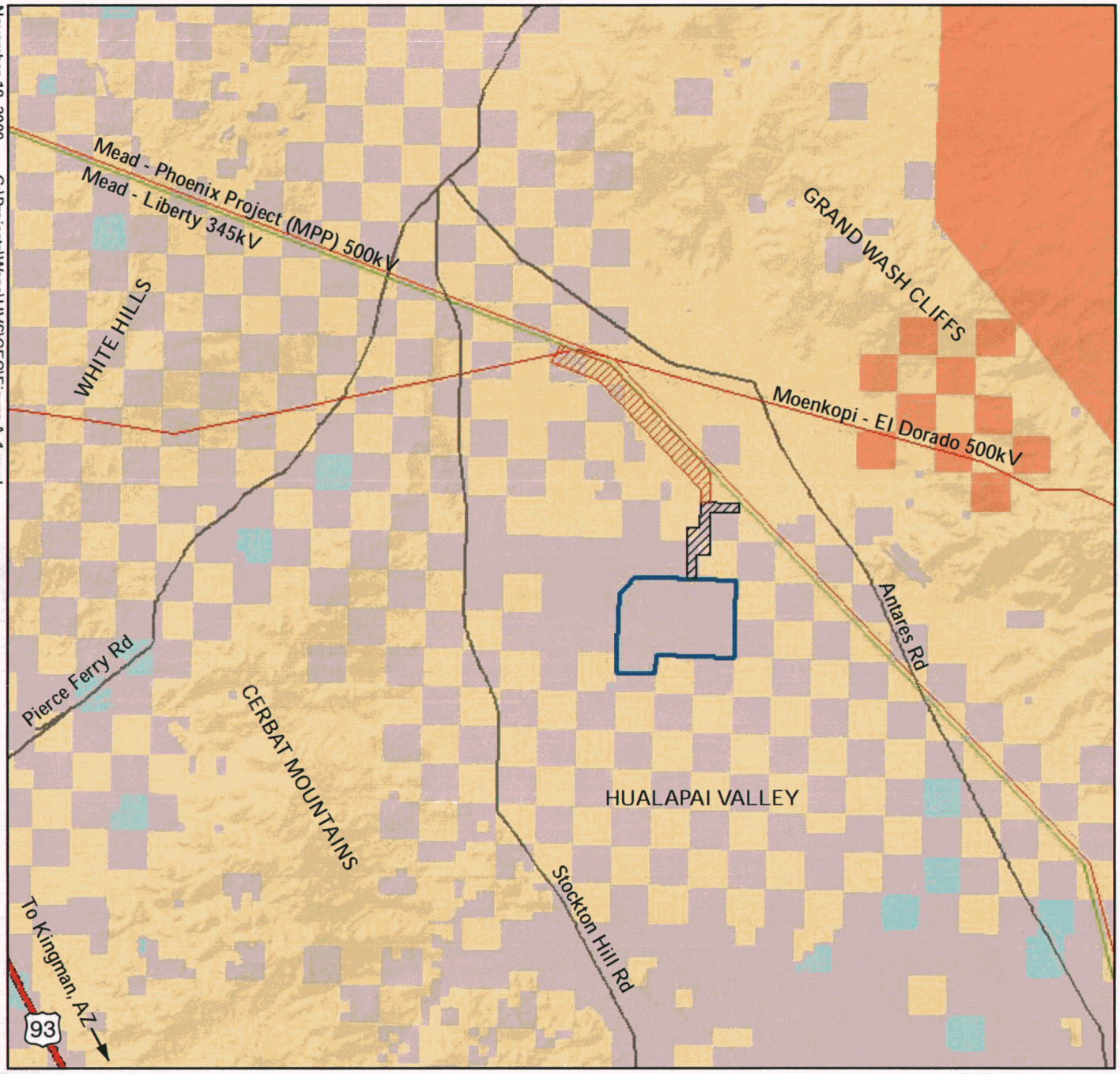
The HVS Project would be consistent with the land use designation for the Project Site, and associated Gen-Tie and access road.

References

County of Mohave, Arizona. General Plan. March 10, 1995
Revised December 5, 2005. http://www.co.mohave.az.us/

County of Mohave, Arizona. Zoning Ordinance. Adopted: September 7, 1965
Revised: October 23, 2008. http://www.co.mohave.az.us/

November 18, 2009 G:\Projects\Wapa\HVS\CEC\Figure A-1.mxd



Legend

- Solar Facility
- Interconnection #1 Gen-Tie
- Interconnection #2 Gen-Tie

Ownership

- BLM
- Hualapai Indian Reservation
- Private
- State Trust

N

1:250,000

0 5 Miles

Ownership information from ALRIS (2006)

Project Area

Hualapai Valley Solar Project

Figure A-1

hualapai valley solar™ a mohave sun power project

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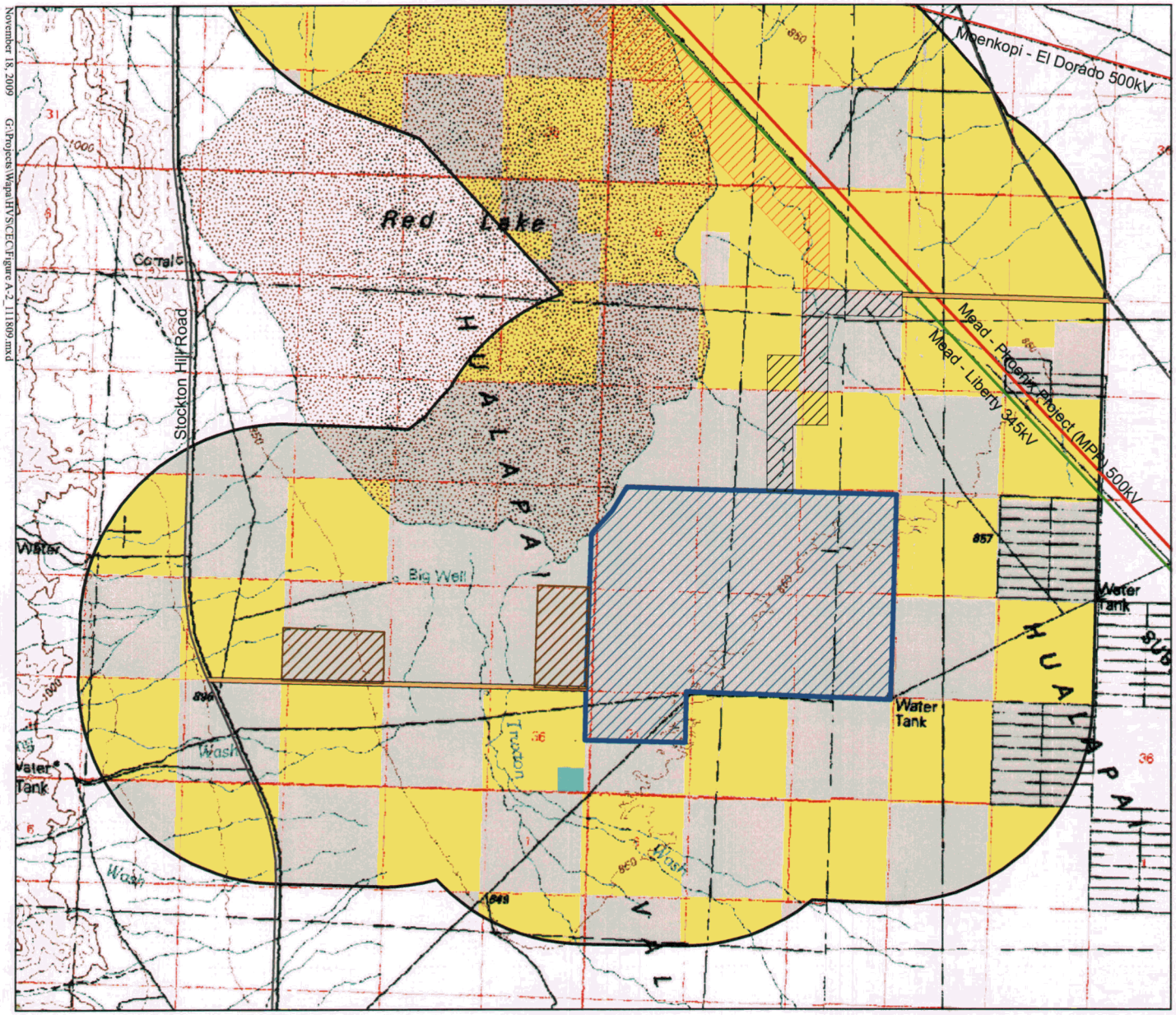


Legend

- Solar Facility
- Laydown Area
- 2-Mile Buffer
- Access Road
- Interconnection #1 Gen-Tie
- Interconnection #2 Gen-Tie

Ownership

- Bureau of Land Management
- Private
- State Trust Land

N

1:62,500

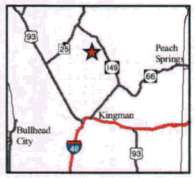
0 6,000 Feet

Panels

2

1

(Quad Map from USGS)



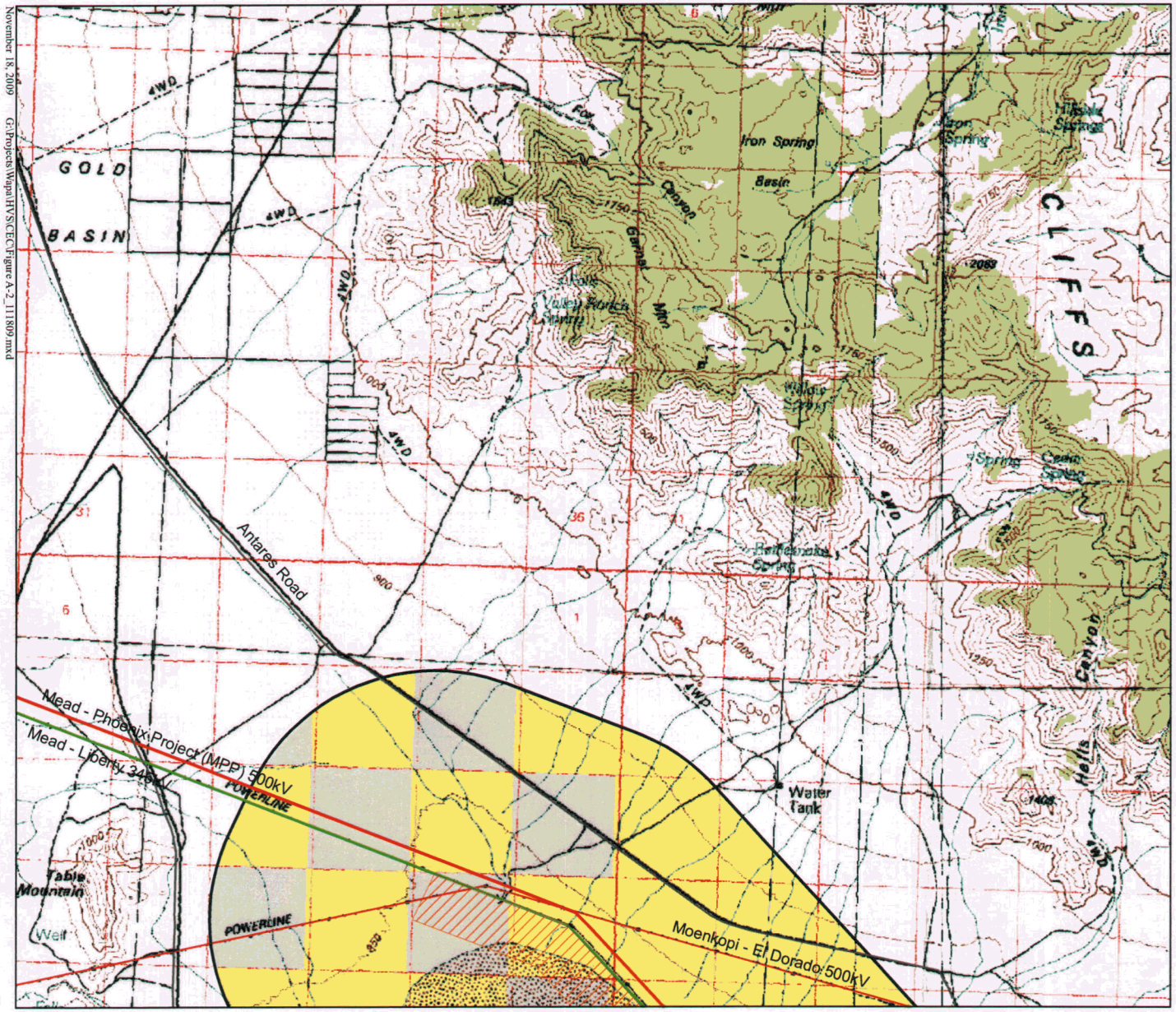
Land Jurisdiction Map
Hualapai Valley Solar Project

hualapai valley solar
a renewe sun power project

TRANSCON ENVIRONMENTAL

Figure A-2

November 18, 2009 G:\Projects\Wapa\HVS\CEC\Figure A-2_111809.mxd



Legend

- Solar Facility
- Laydown Area
- 2-Mile Buffer
- Access Road
- Interconnection #1 Gen-Tie
- Interconnection #2 Gen-Tie

Ownership

- Bureau of Land Management
- Private
- State Trust Land

N

1:62,500

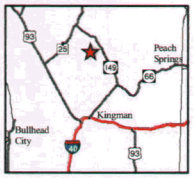
0 6,000 Feet

Panels

2

1

(Quad Map from USGS)

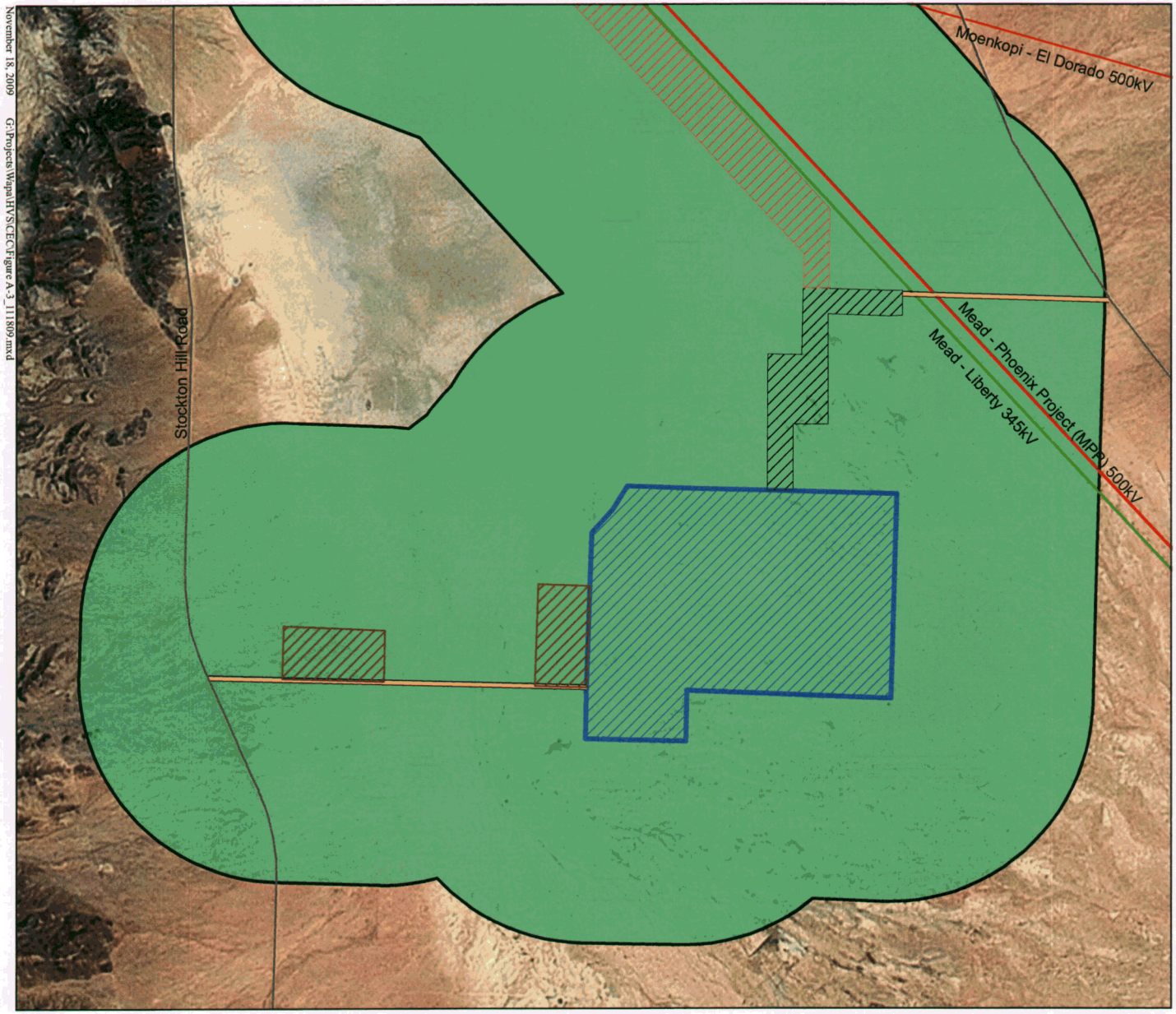


Land Jurisdiction Map
Hualapai Valley Solar Project

hualapai valley solar
TRANSCON

Figure A-2

November 18, 2009 G:\Projects\Wapa\HVS\CEC\Figure A-2_111809.mxd



Legend

- Solar Facility
- Laydown Area
- 2-Mile Buffer
- Access Road
- Interconnection #1 Gen-Tie
- Interconnection #2 Gen-Tie

Planned Land Use

- Rural Development Area

Panels

2
1

N

1:62,500

0 6,000 Feet

(Aerial Imagery from Bing Maps)

Existing Land Use Map
Hualapai Valley Solar Project

hualapai valley solar
TRANSCON ENVIRONMENTAL

Figure A-3

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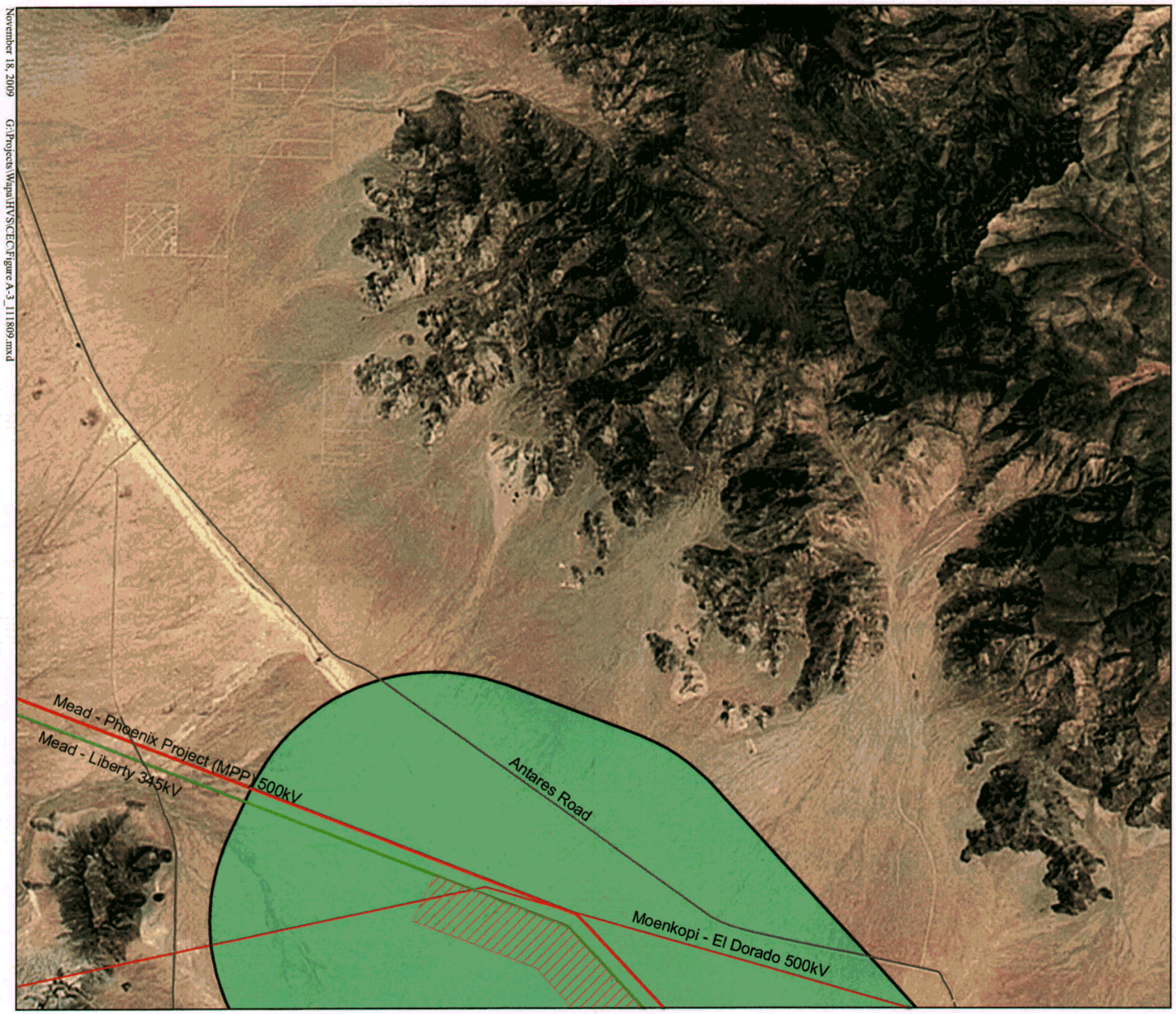

Legend

- Solar Facility
- Laydown Area
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Planned Land Use

- Rural Development Area

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1:62,500

0 6,000 Feet

Panels

2

1

(Aerial Imagery from Bing Maps)

Existing Land Use Map
Hualapai Valley Solar Project

hualapai valley solar
a nextera energy project

TRANSCON ENVIRONMENTAL

Figure A-3

EXHIBIT B: ENVIRONMENTAL STUDIES

As stated in Arizona Administrative Code R14-3-219:

> *"Attach any environmental studies which Applicant has made or obtained in connection with the proposed site(s) or route(s). If an environmental report has been prepared for any federal agency or if a federal agency has prepared an environmental statement pursuant to Section 102 of the National Environmental Policy Act, a copy shall be included as part of this Exhibit."*

The Project is subject to National Environmental Policy Act (NEPA) compliance for two reasons; first, because the generation is planned to interconnect with federal electric transmission line system managed by the Western Area Power Administration (Western) and second, because the interconnecting electric transmission line, the access road, and possibly, a wastewater effluent pipeline[1] will cross Public Land managed by the Bureau of Land Management (BLM). NEPA compliance has been initiated and an Environmental Impact Statement (EIS) is being prepared. Western is the lead federal agency and the BLM is a cooperating agency. A NEPA document, although underway, is not complete and therefore not included in the application. Federal agencies are prevented from concluding their decision until the NEPA process is complete and therefore including federal opinions on impacts is not appropriate. It is reasonable, however to make determinations regarding impacts and compatibility pursuant to the requirements of the Certificate of Environmental Compatibility (CEC) application process. The disclosure of impacts in this and other Exhibits to the Project's CEC application is intended to meet standards for the state process. A Draft of the EIS (DEIS) is expected in first quarter of 2010.

The Project has concluded the federal scoping phase and resource studies are being prepared. The scoping phase is one of the first steps in the NEPA process and engages both the public and resource agencies to determine issues for examination and study. This step ensures that the NEPA document will sufficiently cover the various topics and involve the appropriate agencies and people. A complete copy of the scoping report is contained in **Exhibit J-2.**

Many studies have been prepared in connection with this Project and previous planned Projects. These studies are under review by members of the NEPA technical team in order to assemble a DEIS. Additional studies and research were prepared specifically for this application. Some of the baseline technical studies are included in this and other relevant exhibits in the application.

[1] The Project is pursuing the purchase of effluent from the City of Kingman's wastewater treatment facility to use as replacement for groundwater, and is analyzing routing options to bring that effluent to the Project Site by pipeline.

The Project area has been the subject of at least two large scale previous proposals. First was a gas storage facility, which intended to use the subsurface salt deposits and create caverns capable of storing natural gas, the second was a residential development, which included most of the land to be used for this Project. Research on water and other resources was prepared as part of these previous studies and as previously mentioned is under review as part of this Project.

Contained in **Exhibit B-1** and **Exhibit B-2** are reports prepared for Hydrology & Water Quality, and Air Quality, respectively.

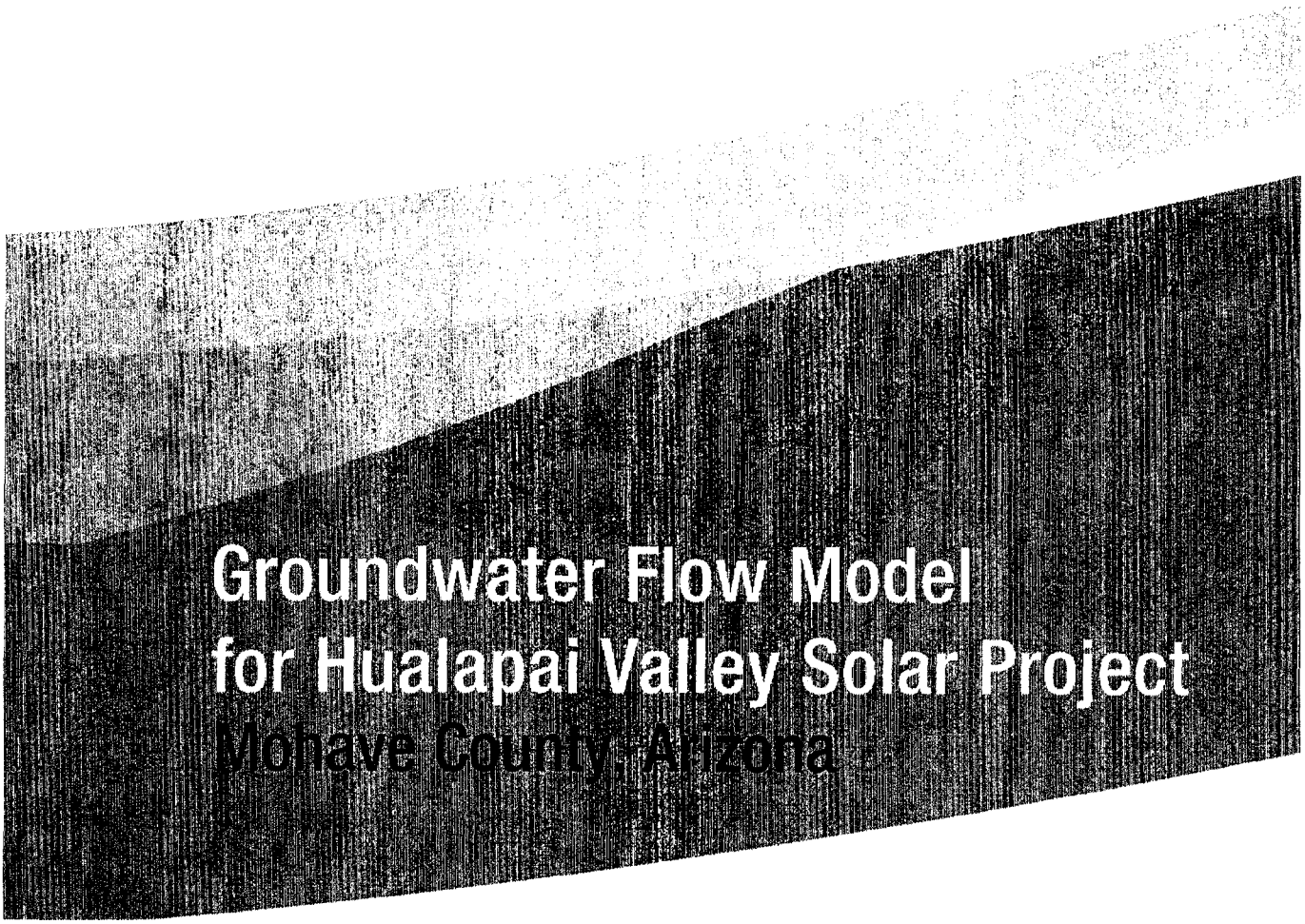
EXHIBIT B-1

MONTGOMERY
& ASSOCIATES
Water Resource Consultants

Technical Memorandum

November 16, 2009

Prepared for:
Hualapai Valley Solar LLC



Groundwater Flow Model for Hualapai Valley Solar Project Mohave County, Arizona

www.elmontgomery.com 480-948-7747 5010 East Shea Blvd. Suite D110, Scottsdale AZ 85254

MONTGOMERY
& ASSOCIATES

November 16, 2009
TECHNICAL MEMORANDUM

GROUNDWATER FLOW MODEL FOR HUALAPAI VALLEY SOLAR PROJECT MOHAVE COUNTY, ARIZONA

Prepared for:

HUALAPAI VALLEY SOLAR LLC

Prepared by:

MONTGOMERY & ASSOCIATES

REGISTERED GEOLOGIST
CERTIFICATE NO.
19807
WILLIAM R
VICTOR
Date Signed 11-16-2009
ARIZONA U.S.A.
Expires 09/30/2010

MONTGOMERY
& ASSOCIATES

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LIST OF ABBREVIATIONS

ADWR	Arizona Department of Water Resources
AF	acre-feet
AF/yr	acre-feet per year
AZGS	Arizona Geological Survey
bls	below land surface
feet msl	feet above mean sea level
ft/day	feet per day
gpd/ft	gallons per day per foot
gpm	gallons per minute
HVS	Hualapai Valley Solar LLC
M&A	Montgomery & Associates
USGS	U.S. Geological Survey

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& ASSOCIATES

November 16, 2009
TECHNICAL MEMORANDUM

GROUNDWATER FLOW MODEL FOR HUALAPAI VALLEY SOLAR PROJECT MOHAVE COUNTY, ARIZONA

SUMMARY OF CONCLUSIONS

Montgomery & Associates (M&A) has prepared this technical memorandum under contract with Hualapai Valley Solar LLC (HVS). **Figure 1** is a location map for the Hualapai groundwater basin. The principal conclusions and recommendations from this investigation include:

1. The Hualapai Valley is a north- to northwest-trending structural basin, separated into three sub-basins at depth by areas of relatively shallow bedrock; from south to north these sub-basins are the Kingman, Red Lake, and Gregg sub-basins **(Figure 1)**. Groundwater in Hualapai Valley generally flows from the Kingman sub-basin northward beneath the Red Lake playa and over the bedrock high north of Red Lake, where it continues north through the Gregg sub-basin and eventually discharges into Lake Mead. Depth to groundwater is in the range from about 250 feet below land surface (bls) north of Red lake to more than 900 feet near Kingman; depth to water in the vicinity of Red Lake is in the range from about 260 to 360 feet. The U.S. Geological Survey (2007) reported that there has been a predominantly stable or rising trend in groundwater levels from the late 1950s to 2006 in the Red Lake sub-basin. Except for the area near Kingman, contours for altitude of groundwater level in winter 2005-2006

are generally similar to those for 1967 and 1980. This similarity indicates that the amount of groundwater removed from storage in the basin has been negligible, except near the City of Kingman wellfield.

2. The volume of groundwater in storage in the principal Hualapai Valley aquifer system far exceeds the annual volume of recharge and discharge of groundwater in the basin. Based on the information compiled for this investigation for the area, depth, and porosity of saturated sediments, total volume of groundwater in storage in the Hualapai basin is calculated to be about 27.7 million acre-feet (AF) to the base of the sediments. This value was obtained by using a basin-wide numerical groundwater flow model to calculate the volume of sediments between the buried surface of the bedrock (or evaporite deposits where they occur) and the winter 2005-2006 groundwater surface. Specific yield used in the model was distributed in the basin according to lithology reported for wells and cross-sections of the basin, and ranged from 2 to 12 percent. Weighted average specific yield used in the model was 9.86 percent. Following a similar procedure, volume of groundwater in storage above a depth of 1,200 feet bls was calculated to be about 15.8 million AF. This value is appropriate and is comparable to the volume of 21 million AF given in a U.S. Geological Survey (USGS) report by Gillespie and Bentley (1971) for the saturated sediments to depths of 1,000 feet bls in the Red Lake area and 1,500 feet bls in southern Hualapai Valley.

3. The numerical groundwater flow model developed by M&A for the Hualapai Valley was originally constructed and calibrated in 2006 and 2007, and was approved by the Arizona Department of Water Resources (ADWR) in 2007; details of the model construction were reported by M&A (2006 and 2007). The proposed groundwater pumping for HVS was added to the existing model to simulate the impact of the proposed facility over its

projected 30-year life. Maximum pumping rate for HVS was assumed to be 3,000 acre-feet per year (AF/yr), which is equivalent to a constant pumping rate of about 1,869 gallons per minute. This rate was the maximum estimated by HVS engineers when they were considering several plant design alternatives and, therefore, was used in the model to be conservative. The current groundwater use estimated by HVS for the wet-cooling alternative is 2,400 AF/yr, not taking into account reuse of other water sources that may become available to the project.

4. The Hualapai model was constructed using MODFLOW (Harbaugh and McDonald, 1996) and Groundwater Vistas, a graphical modeling interface (Rumbaugh and Rumbaugh, 2004). The model includes a steady-state simulation calibrated to match observed pre-development groundwater levels for the period from 1965 to 1970. Simulated groundwater conditions from the steady-state simulation are used as initial conditions for the transient simulation. The model includes a transient simulation for the period from January 1, 1970 through December 31, 2042. The transient model was calibrated to observed conditions for the period from 1970 through 2005. Model parameter sensitivity analyses were conducted for both the steady-state simulation and the transient simulation (from 1970 through 2005). Results of the model calibration indicate that simulated groundwater levels compare well with observed data in most of Hualapai Valley.

5. The model simulates future pumping for the period from 2006 through 2042. Simulated pumping rates are summarized in **Table 2**. Future domestic well pumping is simulated at approximately 34 AF/yr, unchanged from the 2006 rate. Simulated pumping for City of Kingman wells increases from approximately 9,297 AF/yr in 2006 to approximately 12,076 AF/yr in 2014, and is constant from 2014 through 2042. The 2014 Kingman

pumping rate of approximately 12,076 AF/yr represents the Designation of Adequate Water Supply reported by ADWR. Other committed demands are simulated using additional wells with total pumping of approximately 3,893 AF/yr from 2006 through 2042, which was provided by ADWR.

The committed demand for the large residential developments proposed by the Rhodes Homes and Mardian Ranch projects were not used in this analysis due to the uncertainty of these projects proceeding. It is not known how or when these projects and the associated water use will be phased in. For perspective, the unused committed demand for these projects over the last two years since ADWR issued its analyses far exceeds the entire 30-year water demand for the HVS project, yet no homes have been built. In any event, the projected incremental groundwater impact of the HVS project would not be significantly different if the committed demand for the Rhodes Homes and Mardian Ranch projects had been included in the analysis. If the HVS facility is constructed and operated, ADWR will take the HVS committed demand into account when determining groundwater availability for future phases of these developments at such time as they are proposed.

6. Proposed pumping for the HVS plant is approximately 3,000 AF/yr for the period from 2013 through 2042. The simulated pumping is distributed among four wells, HVS-1 through HVS-4, with a pumping rate of 750 AF/yr at each well. Total simulated pumping for the proposed plant is 90,000 AF for the 30-year life of the project. Total simulated pumping for Hualapai Valley is 13,224 AF/yr in 2006, increases to 19,003 AF/yr in 2014, and is constant from 2014 through 2042.

7. Projected groundwater level altitudes at the end of the HVS plant life in 2042 are shown on **Figure 27**. Inspection of **Figure 27** indicates that,

although groundwater continues to move northward through the basin, cones of depression in the water table are projected to occur at the pumping centers near Kingman and at the HVS site. These cones of depression are areas where groundwater moves toward the pumping wells from all directions. When pumping is terminated at a cone of depression, groundwater levels in the dewatered area recover relatively rapidly to some depth below the pre-pumping level; the difference between these levels represents groundwater removed from storage. Comparison of **Figures 21 and 27** indicate that, except for the immediate areas of Kingman and the HVS site, the pre-HVS and post-HVS contour maps are similar.

8. Projected groundwater level declines due solely to the HVS plant after the 30-year project life are shown on **Figure 28**. This map was constructed by taking the difference between the projected groundwater level altitude maps for 2042 with and without HVS pumping. Inspection of **Figure 28** indicates that projected groundwater level decline due to HVS pumping is less than 1 foot north and south of the Red Lake sub-basin. Maximum projected decline at the HVS pumping center is about 38 feet. The 20-foot groundwater level decline contour is roughly coincident with the HVS property boundary; therefore, off-site declines in the vicinity of the plant are generally projected to be less than 20 feet.

9. For the period from 2006 through 2042, the simulated model water balance projects a decrease in aquifer storage of 672,098 AF, based on a total simulated recharge volume of 140,599 AF, a total simulated pumped volume of 672,337 AF, and a total outflow volume via the Lake Mead constant head cells of 140,360 AF. Simulated discharge at the constant head cells decreases from 3,804 AF/yr in 2006 to 3,760 AF/yr in 2042. For the period from 2013 through 2042, the simulated contribution from HVS pumping projects a decrease in aquifer storage of 90,000 AF, based on total

simulated pumped volume of 90,000 AF. The simulated contribution from HVS of outflow volume via the Lake Mead constant head cells is 0 AF.

10. Results of modeling indicate that proposed groundwater pumping for the HVS plant, combined with pumping for City of Kingman wells, domestic wells, and other committed demands, is projected to cause maximum total groundwater level decline of about 48 feet in the vicinity of the HVS plant for the 30-year period from 2013 through 2042. Pumping for the HVS plant alone is projected to cause groundwater level decline of a maximum of about 38 feet in the vicinity of the HVS plant during the 30-year simulation **(Figure 28)**, or about 1.3 feet per year.

November 16, 2009

TECHNICAL MEMORANDUM

GROUNDWATER FLOW MODEL FOR HUALAPAI VALLEY SOLAR PROJECT MOHAVE COUNTY, ARIZONA

INTRODUCTION

This technical memorandum was prepared by Montgomery & Associates (M&A) under contract to Hualapai Valley Solar LLC (HVS) to assess potential impacts to groundwater levels in the Hualapai Valley groundwater basin due to planned pumping to supply the proposed HVS thermal solar power plant, located southeast from Red Lake, Mohave County, Arizona. The site encompasses all or part of Sections 19, 20, 21, 28, 29, 30, and 31 in Township 26 North, Range 16 West. This site is in a remote desert area where surface water is ephemeral and municipal water supplies are distant; groundwater supplies are the most readily available source of water at the proposed site. **Figure 1** is a location map for the Hualapai groundwater basin.

M&A constructed and calibrated a basin-wide numerical groundwater flow model in 2006 and 2007 to simulate historic groundwater conditions from 1965 through 2005, and to project groundwater conditions into the future. This model was approved by the Arizona Department of Water Resources (ADWR) in 2007; details of the model construction and previous use were reported by M&A (2006 and 2007). This technical memorandum summarizes construction of the model and results of use for the current investigation for HVS.

AVAILABLE DATA AND REPORTS

Data and reports from the following sources were used for this technical memorandum: ADWR; Arizona Oil and Gas Conservation Commission; Arizona Geological Survey (AZGS); U.S. Geological Survey (USGS); and various consultants. Many of these sources provide information regarding general hydrogeologic conditions and wells in Hualapai Valley. Much of this information was previously summarized by M&A (2006 and 2007). **Appendix A** describes the well numbering and location system used in Arizona. A summary of general information for wells in Hualapai Valley is provided in **Appendix B; Table B-1** is a well inventory compiled from all available well information databases. Records of all wells within 1.5 miles of the proposed project site and other wells described in this memorandum are highlighted in **Table B-1** for quick reference.

PREVIOUS INVESTIGATIONS

Significant interest in the Red Lake area was generated in the late 1950s by reports of saline groundwater and subsequent discovery of thick halite (rock salt) deposits in the area (Faulds and others, 1997). From 1958 to 1989, four deep wells were drilled into the salt deposit to determine the nature of the deposits and their economic potential (Rauzi, 2002). In the late 1970s and early 1980s, the area was investigated for potential storage of natural gas in caverns to be leached from the salt using local groundwater supplies (Westech, 1980). Several mid-depth water exploration wells and water production wells were drilled south of Red Lake for this project, referred to as the Pataya Gas Storage Project. The Pataya project was never approved by the Federal Energy Regulatory Commission (Rauzi, 2002). From 2001 through 2004, the project was revived under the name Red Lake Gas Storage, L.P. (Arcadis, 2002). An additional deep well (SWE-1D) was drilled for that project north of the

Red Lake salt deposit to assess the potential for injection of brine generated from the cavern leaching process. In 2005, the property related to the Red Lake Gas Storage Project was acquired by Rhodes Homes of Arizona; studies were conducted by M&A (2006 and 2007) to assess water availability for residential development of the property. HVS recently obtained an option to purchase a portion of the Rhodes Homes land for construction of a thermal solar power plant.

In 2005 and 2006, M&A conducted field investigations for selected wells located on Rhodes Homes property in the vicinity of Red Lake. Wells drilled for stock or domestic use were investigated, together with wells drilled for the Pataya Project (M&A, 2006). Of the wells identified in the field, two wells referred to as RL-1 (formerly CER-3) and RL-2 were selected for further investigation and were tested using temporary pumps. Available data for the basin were compiled by M&A (2006 and 2007) to construct and calibrate the groundwater flow model. Further work to assess chemical quality of groundwater in the Red Lake sub-basin was conducted for HVS by M&A (2009).

HYDROGEOLOGIC CONDITIONS

The Hualapai Valley is a north- to northwest-trending structural basin, separated into three sub-basins at depth by areas of relatively shallow bedrock; from south to north these sub-basins are the Kingman, Red Lake, and Gregg sub-basins **(Figure 1)** (M&A, 2006). The Red Lake sub-basin is bounded on the east by the Grand Wash Cliffs and on the west by the Cerbat Mountains. **Figure 2** is a geologic map for Hualapai Valley showing the lines for hydrogeologic sections A-A', B-B', and C-C', which are shown on **Figures 3, 4, and 5**, respectively. A more detailed summary of hydrogeologic conditions in Hualapai Valley is given by M&A (2006 and 2007).

The basin structure is a half-graben developed in the headwall of the steeply west-dipping Grand Wash Fault, located along the eastern margin of the basin; the Cerbat Mountains comprise the exposed portion of the downthrown fault block and the Grand Wash Cliffs comprise the upthrown fault block (Faulds and others, 2001) **(Figure 5)**. The mountains that bound the basin are comprised primarily of igneous, metamorphic, and volcanic rocks; sedimentary rocks of the Colorado Plateau form a cap rock above the Grand Wash Cliffs (Gillespie and Bentley, 1971) **(Figure 2)**.

Inspection of the depth to bedrock contours shown on **Figure 2** and hydrogeologic sections shown on **Figures 3, 4, and 5** indicates the Hualapai Valley structural basin is filled with thick alluvial deposits consisting of sand, gravel, silt, clay, and evaporites; volcanic rocks are locally interbedded with the alluvium in some areas (Gillespie and Bentley, 1971). Relatively coarse-grained alluvial-fan deposits, formed at the foot of the basin-bounding mountain ranges, coalesce toward the axis of the basin and are believed to extend at depth for some distance from the present location of the mountain fronts (M&A, 2006; Gillespie and Bentley, 1971). The Red Lake sub-basin is characterized by internal surface water drainage, which terminates at the Red Lake playa. Extensive fine-grained deposits and minor

evaporites are associated with the playa; these deposits extend laterally and vertically beyond the current area of the playa **(Figures 3 and 5)** (M&A, 2006 and 2007). Aquifer hydraulic properties for Hualapai Valley are summarized in **Table 1**.

The Red Lake halite deposits lying below the alluvium, described earlier in this memorandum, are capped by as much as 400 feet of gypsum and anhydrite. The upper contact of these deposits is known from drillhole data to occur at a depth between about 1,300 to 1,850 feet below land surface (bls) and their total thickness may be in excess of 8,000 feet (Faulds and others, 1997). Recent interpretation of seismic and gravity data suggests that the evaporite deposits in the Red Lake sub-basin are very extensive and encompass most of the sub-basin area **(Figure 2)** (Arcadis, 2002).

Groundwater in Hualapai Valley generally flows from the Kingman sub-basin northward beneath the Red Lake playa and over the bedrock high north of Red Lake, where it continues north through the Gregg sub-basin and eventually discharges into Lake Mead **(Figure 3)** (M&A, 2007; Gillespie and Bentley, 1971). Depth to groundwater is in the range from about 250 feet bls north of Red lake to more than 900 feet near Kingman; depth to water in the vicinity of Red Lake is in the range from about 260 to 360 feet (M&A, 2006). The U.S. Geological Survey (2007) reported that there has been a predominantly stable or rising trend in groundwater levels from the late 1950s to 2006 in the Red Lake sub-basin. Except for the area near Kingman, contours for altitude of groundwater level in winter 2005-2006 are generally similar to those for 1967 and 1980 (M&A, 2006). This similarity indicates that the amount of groundwater removed from storage in the basin has been negligible, except near the City of Kingman wellfield.

GROUNDWATER IN STORAGE

The volume of groundwater in storage in the principal Hualapai Valley aquifer system far exceeds the annual volume of recharge and discharge of groundwater in the basin. Based on the information compiled for this investigation for the area, depth, and porosity of saturated sediments, total volume of groundwater in storage in the Hualapai basin is calculated to be about 27.7 million acre-feet (AF) to the base of the sediments. This value was obtained by using a basin-wide numerical groundwater flow model to calculate the volume of sediments between the buried surface of the bedrock (or evaporite deposits where they occur) and the winter 2005-2006 groundwater surface. Specific yield used in the model was distributed in the basin according to lithology reported for wells and cross-sections of the basin, and ranged from 2 to 12 percent. Weighted average specific yield used in the model was 9.86 percent. Following a similar procedure, volume of groundwater in storage above a depth of 1,200 feet bls was calculated to be about 15.8 million AF. This value is appropriate and is comparable to the volume of 21 million AF given in a U.S. Geological Survey (USGS) report by Gillespie and Bentley (1971) for the saturated sediments to depths of 1,000 feet bls in the Red Lake area and 1,500 feet bls in southern Hualapai Valley.

GROUNDWATER INFLOW AND OUTFLOW

The principal inflow to the basin occurs via groundwater recharge. Groundwater underflow into the basin is believed to be negligible (Gillespie and Bentley, 1971). The principal outflow from the basin occurs via discharge to Lake Mead and pumped wells. Groundwater discharge via evapotranspiration is negligible because groundwater level in the alluvial deposits occurs at large depths, and spring areas are small and limited to the basin

margins. Groundwater underflow out of the basin at locations other than Lake Mead is believed to be negligible.

Prior to 1970, the volume of groundwater pumped from wells in the Hualapai basin was very small (Remick, 1981; Babcock, 1974), and the groundwater system was in a state of dynamic equilibrium. Therefore, the average amount of groundwater entering the basin (inflow) was approximately equal to the average amount of groundwater exiting the basin (outflow).

Groundwater Discharge

Previous studies of the Hualapai basin indicate that estimated annual discharge rate ranges from 2,000 to 4,000 AF/yr, as cited in the following table:

ESTIMATED DISCHARGE RATE (AF/yr)	**SOURCE OF DISCHARGE ESTIMATE** (see section on References Cited)
4,000	Gillespie and Bentley (1971)
2,000-2,500*	Remick (1981)
4,000	Freethey and Anderson (1986)
3,800	Anderson and others (1990 and 1992)

* Calculation is based on aquifer transmissivity and hydraulic gradient at a cross section immediately north of Red Lake and, therefore, does not include recharge in the Hualapai Wash and Dolan Springs areas.

Based on review of available data, a discharge rate of approximately 3,800 AF/yr was assumed for the Hualapai basin for the purposes of this investigation. This rate is consistent

with the most recent studies by Anderson and others (1990 and 1992) and is near the median of the reported values.

Groundwater Recharge

Groundwater recharge occurs principally at the mountain fronts along the east, west, and south margins of the valley. Less recharge occurs along ephemeral streams, including Truxton Wash, Hualapai Wash, the unnamed wash east of Dolan Springs, and the Kingman sub-basin. Gillespie and Bentley (1971) concluded that recharge was negligible along surface water drainage channels on the valley floor. Therefore, it is appropriate for modeling purposes to simulate more of the recharge at the mountain fronts than on the valley floor. For the groundwater flow model, mountain-front recharge was estimated to be about 70 percent of basin recharge; the remaining 30 percent was estimated to recharge along principal surface water drainage channels on the valley floor. Hualapai basin recharge is assumed to be equivalent to groundwater discharge prior to 1970, which is estimated to be about 3,800 AF/yr (Anderson, 1990 and 1992).

GROUNDWATER FLOW MODEL

The numerical groundwater flow model developed by M&A for the Hualapai Valley was originally constructed and calibrated in 2006 and 2007, and was approved by ADWR in 2007; details of the model construction were reported by M&A (2006 and 2007). The proposed groundwater pumping for HVS was added to the existing model to simulate the impact of the proposed facility over its projected 30-year life. Maximum pumping rate for HVS was assumed to be 3,000 acre-feet per year (AF/yr), which is equivalent to a constant pumping rate of about 1,869 gallons per minute (gpm). This rate was the maximum estimated by HVS engineers when they were considering several plant design alternatives and, therefore, was used in the model to be conservative. The current groundwater use estimated by HVS for the wet-cooling alternative is 2,400 AF/yr, not taking into account reuse of other water sources that may become available to the project.

The Hualapai Valley numerical groundwater flow model was originally developed to project potential impacts of proposed groundwater pumping for land development. Construction of the model was based on available hydrogeologic data for Hualapai Valley and on modeling studies conducted for similar alluvial basins in Arizona. The Hualapai model was constructed using MODFLOW (Harbaugh and McDonald, 1996) and Groundwater Vistas, a graphical modeling interface (Rumbaugh and Rumbaugh, 2004).

The Hualapai model is constructed to simulate pre-development equilibrium conditions in the 1965 to 1970 timeframe, past transient groundwater conditions for the period from 1970 through 2005, and future transient conditions. Past transient conditions for the 1970 through 2005 period were dominated by groundwater withdrawals for the City of Kingman. Projected transient conditions are impacted by committed groundwater withdrawals for the City of Kingman, domestic wells, assumed other committed demands,

and proposed groundwater withdrawals for the HVS plant during the 30-year period from 2013 through 2042.

MODEL GRID AND BOUNDARY CONDITIONS

The Hualapai Valley model area encompasses the Gregg, Red Lake, and Kingman sub-basins, covering an area of about 441 square miles (56 miles from south to north and 28 miles from east to west). The model grid consists of two layers with 306 rows and 158 columns. Grid cell dimensions are a uniform 1,320 feet by 1,320 feet, which is ¼ square mile. Of the 96,696 total model cells, 12,553 are simulated as active flow cells. The model grid is shown on **Figure 6**.

Lateral boundaries for the two model layers are shown on **Figure 6**. For each layer, model cells outside the boundaries are specified as inactive. Groundwater underflow into the model domain is believed to be minimal and, to provide conservative results, is not simulated in the model. With the exception of the Lake Mead outflow boundary, model boundaries are specified as no-flow hydrogeologic barriers corresponding to mountains and hills surrounding the three sub-basins. Outflow to Lake Mead occurs via a constant head boundary specified at 1,200 feet above mean sea level (msl).

MODEL STRESS PERIODS AND INITIAL CONDITIONS

The Hualapai Valley model includes a steady-state simulation calibrated to match observed pre-development groundwater levels for the period from 1965 to 1970. Simulated

groundwater conditions from the steady-state simulation are used as initial conditions for the transient simulation. The model includes a transient simulation for the period from January 1, 1970 through December 31, 2042. Duration of transient stress periods is 365.25 days.

MODEL LAYERS AND AQUIFER PARAMETERS

Model layers were constructed based on hydrogeologic conditions for the basin (M&A, 2006 and 2007). Aquifer parameters specified for model layers are hydraulic conductivity, specific yield, and storage coefficient. Hydraulic conductivities specified in the model are based on values determined from measured aquifer test data and calculated specific capacity in Hualapai Valley, as shown on **Figure 7** and given on **Table 1**. Storage values are based on studies conducted by M&A and others for similar alluvial basin aquifers and are considered to be conservatively small for purposes of this study. Specific yield is based on values reported for Arizona basins, including values reported for Hualapai Valley by Gillespie and Bentley (1971). Both hydraulic conductivity and specific yield were evaluated and modified as part of the model calibration process.

Model Layer 1

Model Layer 1 generally comprises an upper layer that includes coarse-grained sediments, but is distinguished from the underlying layer chiefly by the relative abundance of finer-grained sediments, particularly playa and other fine-grained deposits in the Red Lake sub-basin. The approximate base of Layer 1 is shown on hydrogeologic sections A-A', B-B', and C-C' **(Figures 3, 4, and 5)**. Altitude of the base of Layer 1 is shown on **Figure 8**.

Based on simulated groundwater levels for winter 2005-2006, saturated thickness of Layer 1 ranges from 0 feet at the bedrock boundaries to more than 500 or 600 feet in the Gregg, Red Lake, and Kingman sub-basins. Initial saturated thicknesses in Layer 1 prior to start of the predictive pumping period are shown on **Figure 9**.

Layer 1 is simulated as unconfined with hydraulic conductivity and specific yield specified. Distribution of model horizontal hydraulic conductivity and specific yield for Layer 1 is shown on **Figure 10**. Simulated horizontal hydraulic conductivity ranges from less than 1 to 100 feet per day (ft/day), as described in the following summaries:

1. Conductivity values of 1.0 ft/day (zone 9) and 4.0 ft/day (zone 4) are simulated for the Truxton Wash and Dolan Springs areas, respectively. The value for Truxton Wash is based on observed groundwater conditions, and the value for Dolan Springs is consistent with specific capacity data from wells; we believe the 109.4 ft/day value derived from specific capacity is not representative for the Dolan Springs alluvial aquifer because the well appears to be completed in bedrock.

2. A conductivity value of 2.0 ft/day is simulated for the playa deposits (zone 6). The value for the shallow playa deposits is consistent with the 0.8 ft/day measured conductivity value calculated from a pumping test at well B(26-16)29bbb. The eight other calculated conductivity values in the Red Lake sub-basin, including two located north-northwest from Long Mountain, do not correspond to the playa deposits represented by conductivity zone 6 in model Layer 1. Based on lithologic data, it is believed the eight calculated hydraulic conductivity values are more representative of the underlying basin-fill sediments (zone 24 in model Layer 2 in this area), rather than the shallower playa deposits (model Layer 1 in this area). Two of the northern wells, B(26-17)23cdd {RL-1}[55-086253] and B(26-17)23ccc1{Big Well Neal #1}[55-600495] **(Table 1)**, support this concept. As shown on hydrogeologic section C-C' **(Figure 5)**, wells 55-086253 and 55-600495 are both substantially completed in the underlying basin-fill deposits. The two southern wells, B(24-16)10aaa[55-525380] and B(24-16)10caa[55-525381] **(Table 1)**, are also substantially completed in the underlying basin-fill deposits, with perforations from depths of approximately 400 feet to 1,100 feet bls.

3. A conductivity value of 2.1 ft/day is simulated for the approximate northern half of the Kingman sub-basin (zone 7). This value is consistent with pumping tests and specific capacity data in the area.

4. A conductivity value of 6.5 ft/day is simulated for the alluvial deposits adjacent to Long Mountain (zone 10). This value is consistent with specific capacity data.

5. Conductivity values of 6.6 ft/day (zone 1) and 18.0 ft/day (zone 21) are simulated for alluvial deposits north from Gregg sub-basin. These values are consistent with values from pumping tests.

6. A conductivity value of 4.8 ft/day (zone 22) is simulated for alluvial deposits in the Gregg sub-basin. This value is consistent with values from pumping tests.

7. A conductivity of 100 ft/day is simulated for the alluvial deposits south from Gregg sub-basin (zone 3). This value is consistent with the 118 ft/day value calculated from a pumping test in the area. It should be noted the model is not sensitive to hydraulic conductivity changes for this zone **(Figure 18)**.

8. A conductivity value of 30 ft/day is simulated for the alluvial deposits in the east and west margins of the Red Lake sub-basin (zone 24), outside of the playa deposits area. There are no aquifer test or specific capacity data available for the zone 24 area in Layer 1; however, this conductivity is reasonable for the coarse-grained sediments found in those parts of alluvial fans that are near the mountain fronts. Zone 24 in model Layer 1 represents the continuation of zone 24 simulated in model Layer 2.

9. A narrow hydraulic conductivity zone of 1 ft/day (zone 5) was specified along the northeast margin of the Red Lake sub-basin, outside of the zone 6 playa deposits. There are no aquifer test or specific capacity data available for this area. Zone 5 in model Layer 1 represents the continuation of zone 5 simulated in model Layer 2.

10. A conductivity value of 15 ft/day is simulated for the approximate southern half of the Kingman sub-basin (zone 8). This value is consistent with values from pumping tests and specific capacity data.

Vertical hydraulic conductivity of Layer 1 is specified as 10 percent of horizontal hydraulic conductivity. This value is consistent with the typical range assumed for interbedded alluvial deposits of varying texture in the southwest United States.

Simulated specific yield for model Layer 1 is 0.08 for the playa deposits and 0.12 for the remainder of the model layer **(Figure 10)**. Gillespie and Bentley (1971) estimated that specific yield ranges from 0.05 to 0.10 for the older alluvium aquifer in Hualapai Valley.

Model Layer 2

Model Layer 2 comprises a layer that has a smaller relative abundance of fine-grained sediments in the Red Lake sub-basin and is somewhat more indurated than overlying Layer 1. Layer 2 does not extend into the Dolan Springs area or into the groundwater outflow area north of the Gregg sub-basin. The approximate base of model Layer 2 is shown on hydrogeologic sections A-A', B-B', and C-C' **(Figures 3, 4, and 5)**. Altitude of the base of model Layer 2 is shown on **Figure 11**. Saturated thickness of Layer 2 ranges from 0 feet at the bedrock boundaries to more than 1,800 feet in the Gregg sub-basin, to more than 600 feet in the Red Lake sub-basin, and to more than 3,800 feet in the Kingman sub-basin. Initial saturated thicknesses in Layer 2 prior to the start of the predictive pumping period are shown on **Figure 12**.

Layer 2 is simulated as semiconfined with hydraulic conductivity, specific yield, and storage coefficient specified. Distribution of model horizontal hydraulic conductivity and specific yield for Layer 2 is shown on **Figure 13**. Simulated horizontal hydraulic conductivity ranges from less than 0.5 ft/day to 30 ft/day. In most areas, hydraulic conductivities are generally consistent with overlying zones specified for Layer 1, with the following exceptions:

1. In the Red Lake sub-basin, extent of playa deposits is substantially smaller than in overlying Layer 1. As shown on **Figure 13**, with the exception of a single pumping test shown on **Figure 10**, pumping test and specific capacity data are for wells screened completely or predominantly below the shallow playa deposits. The 30 ft/day conductivity specified for the

alluvial deposits (zone 24) underlying the shallow playa deposits is consistent with pumping tests and specific capacity data.

2. A conductivity of 1 ft/day was specified in the region immediately north from Red Lake (zone 5). There are no aquifer test or specific capacity data available for the zone 5 area; the specified conductivity was adjusted to match observed groundwater levels and groundwater level changes in the area.

3. A conductivity value of 0.5 ft/day is simulated for the alluvial deposits adjacent to Long Mountain (zone 20). This value is consistent with specific capacity data, and was reduced from overlying Layer 1 conductivity to better match observed groundwater levels and groundwater level changes in the area.

As for Layer 1, vertical hydraulic conductivity of Layer 2 is specified as 10 percent of horizontal hydraulic conductivity.

Simulated specific yield for model Layer 2 is 0.02 for the Tertiary volcanic deposits interbedded with alluvial deposits in the western Kingman sub-basin, 0.08 for the playa deposits, and 0.10 for the remainder of the model layer **(Figure 13)**. Specific yield for most of the alluvial sediments was decreased from 0.12 in Layer 1 to 0.10 in Layer 2 to account for compaction of aquifer material with depth. Simulated storage coefficient for model Layer 2 is 0.005, which is consistent with values used for similar alluvial basin studies in Arizona. The model uses specific yield for Layer 2 cells where water level is below the top of Layer 2. The model uses storage coefficient for Layer 2 cells where water level is above the top of Layer 2.

HISTORIC GROUNDWATER DISCHARGE (pre-1970 through 2005)

Simulated groundwater discharge from 1970 through 2005 includes groundwater underflow to Lake Mead and pumping of wells. Groundwater underflow from Hualapai

Valley to adjacent basins is assumed to be negligible based on available hydrogeologic data, and is not simulated in the model. Evapotranspiration of groundwater is assumed to be negligible in Hualapai Valley and is not simulated.

Groundwater discharge to Lake Mead for the steady-state simulation is 3,800 AF/yr. Simulated discharge to Lake Mead increases to 3,812 AF/yr by end of year 2005.

Groundwater pumping in Hualapai Valley for the steady-state simulation is assumed negligible and is not simulated. Details for individual well pumping for the period from 1970 through 2005 are summarized in **Table 2**. Simulated groundwater pumping for the period from 1970 through 2005 includes City of Kingman wells and domestic wells, and increases from 0 to 8,982 AF/yr. City of Kingman municipal well pumping is simulated as increasing linearly from 0 to 8,950 AF/yr, and domestic wells are simulated as increasing from 0 AF/yr for 1970 to approximately 2.5 AF/yr for 1971, then to approximately 32 AF/yr for 2005 **(Table 2)**. All simulated domestic wells are assigned a pumping rate of approximately 0.25 AF/yr and start pumping the year that they are recorded with ADWR as being installed. Locations for simulated pumping wells are shown on **Figure 14**.

BASIN RECHARGE

Recharge in the Hualapai Valley model is simulated as mountain-front recharge and recharge from ephemeral streams. For both the steady-state (pre-1970) and transient (1970 through 2042) model simulations, combined mountain-front and ephemeral stream recharge is simulated as 3,800 AF/yr, which is equal to the total estimated basin discharge. Distribution of simulated recharge is shown on **Figure 15** and is summarized in the following table:

SIMULATED RECHARGE RATE (AF/yr)	RECHARGE LOCATION
600	Hualapai Wash*
300	Dolan Springs area*
775	Grand Wash Cliffs Mountain Front
575	Cerbat Mountain Front
550	Truxton Wash
700	Kingman Mountain Front
300	Kingman washes
3,800	**TOTAL**

* Value includes both mountain-front and ephemeral stream recharge.

Based on studies by Gillespie and Bentley (1971), mountain-front recharge was specified as approximately 70 percent of basin recharge; the remaining 30 percent was specified as ephemeral stream recharge. Mountain-front recharge is specified in locations where Layer 2 model cells are active, which allows recharge in the cases where overlying Layer 1 recharge cells are initially dry (inactive) or become dry due to projected dewatering.

MODEL CALIBRATION AND SENSITIVITY ANALYSES

The steady-state model was calibrated to conditions observed in the 1965 to 1970 timeframe and the transient model was calibrated to observed conditions for the period from 1970 through 2005. Model parameter sensitivity analyses were conducted for both the steady-state simulation and the transient simulation (from 1970 through 2005). Results of

the steady-state and 1970 through 2005 transient simulations, model calibration, and sensitivity analyses are summarized in the following sections.

Steady-State Model Simulation, Calibration, and Sensitivity Analysis

Contours of simulated groundwater level altitude for the 1970 steady-state conditions and observed groundwater levels used for model calibration are shown together for comparison on **Figure 16**. Observed groundwater levels are for the period from 1965 through 1970. Residuals of observed minus simulated groundwater levels are shown on **Figure 16**; simulated groundwater levels compare well with observed data in most of Hualapai Valley. The largest difference between simulated and observed groundwater levels occurs in Truxton Wash at well 33ada, where the simulated groundwater level is approximately 52 feet less than the observed **(Figure 16)**.

A graph comparing steady-state simulated and observed groundwater levels is shown on **Figure 17**. The model simulation compares well to observed groundwater levels with a residual mean error of 13.92 feet, a residual standard deviation of 23.64 feet, and a residual standard deviation divided by the range of observed data of 2.5 percent. Acceptable values for the residual standard deviation divided by the observed data range should be less than 10 percent (Rumbaugh and Rumbaugh, 2007).

Analyses were conducted to evaluate sensitivity of the model calibration to variations in model parameters. Sensitivity was measured as the average absolute groundwater level residual (observed minus simulated). The average absolute residual for the calibrated steady-state simulation is 17.92 feet. The following parameters were varied for the steady-state sensitivity analysis:

- horizontal hydraulic conductivity for each simulated conductivity zone (conductivity zones are shown on **Figures 10 and 13**);
- vertical hydraulic conductivity for the entire model; and
- recharge for the entire model.

Results of varying horizontal hydraulic conductivity for each model zone are shown on **Figure 18**. Conductivity was decreased and increased by 50 percent for the analysis. Results indicate the model calibration is relatively insensitive to changes in conductivity in most model zones. The model is most sensitive to decreases in conductivity in zone 1, and less sensitive to increases in zone 1. The model is also sensitive to decreases and increases in conductivity in zone 21. Zones 1 and 21 are the northernmost zones in the model domain. Because simulated groundwater level gradients in model zones 1 and 21 substantially affect gradients throughout the entire model domain, it is expected the calibration would be sensitive to conductivity changes in zones 1 and 21. The model is also sensitive to changes in conductivity in zone 9, the Truxton Wash area; however, with the steep hydraulic gradients in this area and two observed groundwater level calibration points, conductivity changes would be expected to result in substantial local calibration changes that have negligible effects on the rest of the model.

Results of varying vertical hydraulic conductivity for the entire model are shown on **Figure 19**. The variations are shown as the change in ratio of horizontal to vertical conductivities, with horizontal conductivity held constant. The ratio is decreased to 1:1 and increased to 50:1. Results show the model is relatively insensitive to changes in the vertical hydraulic conductivity.

Results of varying recharge for the entire model are shown on **Figure 20**. Recharge was increased and decreased by 50 percent for the analysis. The average absolute residual increases approximately 480 and 170 feet for the 50 percent decrease and increase, respectively, indicating the model calibration is very sensitive to changes in total recharge.

Because recharge is the only inflow source to the model, it is expected the calibration would be sensitive to recharge variations.

Transient Model Simulation (1970-2005), Calibration, and Sensitivity Analysis

Transient conditions in Hualapai Valley were simulated for the period from 1970 through 2005. Simulated changes in groundwater stresses during this period included increase of pumping for City of Kingman municipal supply wells from 0 AF/yr in 1970 to 8,950 AF/yr in 2005, and simulation of domestic wells as increasing from 0 AF/yr for 1970 to approximately 2.5 AF/yr for 1971, then to approximately 32 AF/yr for 2005 **(Table 2)**. These groundwater pumping stresses are consistent with groundwater level change measured in wells in the Kingman sub-basin and negligible change measured in wells in areas north from the Kingman sub-basin (M&A, 2006 and 2007).

Simulated and observed data for the transient calibration period were compared for the Kingman sub-basin, Long Mountain area, and Red Lake area. Locations of wells for which hydrographs were constructed are shown on **Figure 21**. The hydrographs include:

- Hydrographs for nine wells in the Kingman sub-basin, B(22-16)03cbb, B(22-16)27ddd, B(22-16)28bad, B(21-15)05bbb, B(22-16)01dcc, B(22-16)15ccc, B(22-16)26bac, B(22-16)34cbc, and B(22-16)33cdc, are shown on **Figures 22a through 22c**;

- Hydrographs for two wells near Long Mountain, B(23-15)08ddd and B(24-14)28cad, are shown on **Figure 22d**; and

- Hydrographs for three wells near Red Lake, B(24-16)01ddd1, B(26-17)35aaa, and B(27-16)33baa, are shown on **Figure 22e**.

Contours of simulated groundwater level altitude for Hualapai Valley at the end of 2005 and observed groundwater levels used for model calibration are shown together for

comparison on **Figure 21**. Observed groundwater levels are for the period from October 2005 through February 2006. Simulated groundwater levels compare reasonably well with observed data. The largest difference between simulated and observed groundwater levels occurs in the upper reaches of Truxton Wash and in Dolan Springs. In these areas, the steep observed gradients are difficult to simulate; however, the overall gradients for these areas are considered acceptable for the calibration.

A graph comparing simulated versus observed groundwater levels is shown on **Figure 23**. The model simulation compares well to observed groundwater levels with a residual mean error of 13.54 feet, a residual standard deviation of 54.88 feet, and a residual standard deviation divided by the range of observed data of 5.2 percent. Acceptable values for the residual standard deviation divided by the observed data range should be less than 10 percent (Rumbaugh and Rumbaugh, 2007).

Analyses were conducted to evaluate sensitivity of the transient model calibration to variations in model parameters. Parameters were selected that would cause changes in the transient calibration and that had not already been adequately evaluated in the steady-state sensitivity analysis. Sensitivity was measured as the average absolute groundwater level residual (observed minus simulated). The average absolute residual for the calibrated transient simulation is 26.77 feet. The following parameters were varied for the transient sensitivity analysis:

- horizontal hydraulic conductivity for zones in the Kingman sub-basin (conductivity zones are shown on **Figures 10 and 13**);
- specific yield for the volcanic, playa, and alluvial deposits (specific yield zones are shown on **Figures 10 and 13**); and
- storage coefficient for the entire model.

Results of varying horizontal hydraulic conductivity for Zones 7, 8, 10, and 20 are shown on **Figure 24**. Conductivity was decreased and increased by 50 percent for the

analysis. Results indicate the model calibration is marginally sensitive to decreases in conductivity in zone 8, located in the approximate southern half of the Kingman sub-basin. Model sensitivity to other changes is negligible.

Results of varying specific yield for the volcanic, playa, and alluvial deposits are shown on **Figure 25**. Specific yield for the analysis was decreased and increased by 50 percent for the volcanic deposits and by 25 percent for the playa and alluvial deposits. Results indicate the model calibration is relatively insensitive to changes in specific yield for the Kingman pumping stresses simulated in the model. Larger pumping stresses during the calibration period would be expected to result in the model being more sensitive to changes in specific yield. However, specific yield values specified in the model are believed to be appropriate for purposes of this analysis.

Results of varying storage coefficient for the entire model are shown on **Figure 26**. Storage coefficient was decreased to 0.001 and increased to 0.01. Results indicate the model calibration is relatively insensitive to changes in storage coefficient.

SIMULATED FUTURE PUMPING THROUGH 2042

The model simulates future pumping for the period from 2006 through 2042. Simulated pumping rates are summarized in **Table 2**. Future domestic well pumping is simulated at approximately 34 AF/yr, unchanged from the 2006 rate. Simulated pumping for City of Kingman wells increases from approximately 9,297 AF/yr in 2006 to approximately 12,076 AF/yr in 2014, and is constant from 2014 through 2042. The 2014 Kingman pumping rate of approximately 12,076 AF/yr represents the Designation of Adequate Water Supply reported by ADWR. Other committed demands are simulated using 14 additional wells with total pumping of approximately 3,893 AF/yr from 2006 through 2042, which was

provided by ADWR. ADWR recommended both the Kingman and the other committed demand pumping rates during a meeting on January 24, 2007. Pumping for the proposed HVS plant is simulated for the period from 2013 through 2042. Locations for simulated pumping wells are shown on **Figure 14**.

Proposed pumping for the HVS plant is approximately 3,000 AF/yr for the period from 2013 through 2042. The simulated pumping is distributed among four wells, HVS-1 through HVS-4, with a pumping rate of 750 AF/yr at each well. Total simulated pumping for the proposed plant is 90,000 AF for the 30-year life of the project.

Total simulated pumping for Hualapai Valley is 13,224 AF/yr in 2006, increases to 19,003 AF/yr in 2014, and is constant from 2014 through 2042.

The committed demand for the large residential developments proposed by the Rhodes Homes and Mardian Ranch projects were not used in this analysis due to the uncertainty of these projects proceeding. It is not known how or when these projects and the associated water use will be phased in. For perspective, the unused committed demand for these projects over the last two years since ADWR issued its analyses far exceeds the entire 30-year water demand for the HVS project, yet no homes have been built. In any event, the projected incremental groundwater impact of the HVS project would not be significantly different if the committed demand for the Rhodes Homes and Mardian Ranch projects had been included in the analysis. If the HVS facility is constructed and operated, ADWR will take the HVS committed demand into account when determining groundwater availability for future phases of these developments at such time as they are proposed.

Projected Results for 2006 through 2042

Projected groundwater level altitudes at the end of the HVS plant life in 2042 are shown on **Figure 27**. Inspection of **Figure 27** indicates that, although groundwater continues to move northward through the basin, cones of depression in the water table are projected to occur at the pumping centers near Kingman and at the HVS site. These cones of depression are areas where groundwater moves toward the pumping wells from all directions. When pumping is terminated at a cone of depression, groundwater levels in the dewatered area recover relatively rapidly to some depth below the pre-pumping level; the difference between these levels represents groundwater removed from storage. Comparison of **Figures 21 and 27** indicates that, except for the immediate areas of Kingman and the HVS site, the pre-HVS and post-HVS contour maps are similar.

Projected groundwater level declines due solely to the HVS plant after the 30-year project life are shown on **Figure 28**. This map was constructed by taking the difference between the projected groundwater level altitude maps for 2042 with and without HVS pumping. Inspection of **Figure 28** indicates that projected groundwater level decline due to HVS pumping is less than 1 foot north and south of the Red Lake sub-basin. Maximum projected decline at the HVS pumping center is about 38 feet. The 20-foot groundwater level decline contour is roughly coincident with the HVS property boundary; therefore, off-site declines in the vicinity of the plant are generally projected to be less than 20 feet.

Areas where the aquifer was unsaturated in 2005-2006, together with areas projected to be dewatered due to pumping until 2042, are shown in black on **Figures 27 and 28**. Only a small fraction of the black area is due to additional dewatering from 2006 to 2042. To enable the model to continue simulating City of Kingman demand where wells are located in areas that become dewatered during this period, the pumping cell representing Kingman well B(22-16)19baa **(Figure 14)** was moved approximately 8 model grid cells, or 2 miles, to the east for the period from 2007 to 2042. With the exception of small simulated pumping

centers located in dewatered model cells, other simulated pumping is unaffected by dewatering and continues through 2042 for all wells shown on **Figure 14 and Table 2**. Future simulated pumping losses due to dewatering of model cells is about 5 AF/yr, or 0.07 percent of total future pumping for 2006 through 2042; therefore, these losses have negligible effect on the overall projected water level drawdown for the basin. Simulated recharge was also unaffected by dewatering.

For the period from 2006 through 2042, the simulated model water balance projects a decrease in aquifer storage of 672,098 AF, based on a total simulated recharge volume of 140,599 AF, a total simulated pumped volume of 672,337 AF, and a total outflow volume via the Lake Mead constant head cells of 140,360 AF. Simulated discharge at the constant head cells decreases from 3,804 AF/yr in 2006 to 3,760 AF/yr in 2042.

For the period from 2013 through 2042, the simulated contribution from HVS pumping projects a decrease in aquifer storage of 90,000 AF, based on total simulated pumped volume of 90,000 AF. The simulated contribution from HVS of outflow volume via the Lake Mead constant head cells is 0 AF.

MODELING SUMMARY

The Hualapai groundwater flow model was constructed for the purpose of demonstrating 30-year groundwater availability for the proposed HVS plant in Hualapai Valley. Conservative assumptions were used in construction of the model, including:

- simulation of a closed aquifer basin, other than the Lake Mead outflow, which precludes capture of groundwater from adjacent basins;
- simulation of other committed demands begins in 2006, though much of this use has not actually started as of 2009; and
- .simulation of 3,000 AF/yr for HVS groundwater demand, though current projection is a demand of 2,400 AF/yr, not counting the use of about 1,800 AF/yr of treated effluent from City of Kingman instead of groundwater.

Results of modeling indicate that proposed groundwater pumping for the HVS plant, combined with pumping for City of Kingman wells, domestic wells, and other committed demands, is projected to cause maximum total groundwater level decline of about 48 feet in the vicinity of the HVS plant for the 30-year period from 2013 through 2042. Pumping for the HVS plant alone is projected to cause groundwater level decline of a maximum of about 38 feet in the vicinity of the HVS plant during the 30-year simulation **(Figure 28)**, or about 1.3 feet per year.

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Table

1 SUMMARY OF AQUIFER HYDRAULIC PARAMETERS FOR HUALAPAI VALLEY

2 SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2042, HUALAPAI VALLEY MODEL

TABLE 1. SUMMARY OF AQUIFER HYDRAULIC PARAMETERS FOR HUALAPAI VALLEY

	WELL INFORMATION						PUMPING TEST DATA					TRANSMISSIVITY (T)			HYDRAULIC CONDUCTIVITY			
	CADASTRAL LOCATION	ADWR 55-WELL REGISTRY NUMBER	GWSI SITE ID	ADWR 35-WELL REGISTRY NUMBER	WELL NAME	LENGTH OF SATURATED PERFORATIONS (feet)	DATE	DURATION (hours)	PUMPING RATE (gpm)	WATER LEVEL DRAWDOWN (feet)	SPECIFIC CAPACITY (S.C.) (gpm/ft)	CALCULATED FROM SPECIFIC CAPACITY (gpd/ft) / (ft^2/day)	REPORTED FROM PUMPING TEST (gpd/ft) / (ft^2/day)	Ratio T / S.C.	BASED ON S.C. (ft/day)	BASED ON REPORTED T (ft/day)	DATA SOURCE	TRANSMISSIVITY CALCULATED TESTS BY M&A
1	B(21-17) 01CAB			13579		385	1963		300	100	3.0	6,000 / 800			2.1		Wells35	
2	B(21-17) 01CAB		351403114025501			385			300	200	1.5	3,000 / 400			1.0		GWSI	
3	B(22-15)19CBB	903521			PH-1	751	2/1/2006	24	2,858	132	21.7	43,400 / 5,800	72,000 / 9,600	3,318	7.7	12.8	M&A	DD = 87,400 gpd/ft RC = 56,500 gpd/ft
4	B(22-16) 15CCC	612657		13697		450	1970		2,440	100	24.4	48,800 / 6,500			14.5		Wells35	
5	B(22-16) 15CCC	612657	351702113582701		LONG MNT NO 6	450	3/4/1980		1,580	146	10.8	21,600 / 2,900			6.4		GWSI	
6	B(22-16) 19BAA	612658		13698		380	1965		700	10	70.0	140,000 / 18,800			49.2		Wells35	
7	B(22-16) 26BAC	605484				480			800	51	15.7	31,400 / 4,200			8.7		Wells55	
8	B(22-16) 26BAC	605484				480	pre-1971		660	51	12.9	25,800 / 3,500	44,000 / 5,900	3,411	7.2	12.3	G&B	
9	B(22-16) 28DBB			13701		465			500	22	22.7	45,500 / 6,100			13.1		Wells35	
10	B(22-16) 33BCC	612666		13702	Kingman #3	350	9/2/1971	7	1,500	72	20.8	41,700 / 5,600			15.9		Wells35	
11	B(22-16) 34CBC	612664		13704	35-48813 35-58166	350	4/13/1978		1,100	15	73.3	146,700 / 19,700			56.0		Wells35	
12	B(23-15) 08DDD	624999	352304113532001			454		2	1,000	110	9.1	18,200 / 2,400			5.4		GWSI	
13	B(23-15) 30CBB	606421		13801	35-23321	607	8/1973		170	200	0.9	1,700 / 200			0.4		Wells35	
14	B(23-16) 09AAB	632333		13803	35-83828	110	3/28/1980		10	100	0.1	200 / -			0.2		Wells35	
15	B(23-16) 15BDB	606420	352253113581201			280			550	20	27.5	55,000 / 7,400			26.3		GWSI	
16	B(24-16) 10AAA	525380				711	1/1990		3,000	63	47.6	95,200 / 12,800			17.9		Wells55	
17	B(24-16) 10CAA	525381				681	1/1/1990		3,300	35	94.3	188,600 / 25,300			37.0		Wells55	
18	B(26-16) 29BBB	600494		13903	35-82802 CER-1	344	12/1979	8	220	110	2.0	4,000 / 500	2,100 / 300	1,050	1.6	0.8	Wells35; AG&M	
19	B(26-17) 23CBB2	086254			CER-4	306			1,750			-	238,000 / 31,900			104.0	AG&M	
20	B(26-17) 23CBB	086254				350	7/8/1981		1,800	240	7.5	15,000 / 2,000			5.7		Wells55	
21	B(26-17) 23CCC	600495		13907	BIG WELL Neal #1	428	1957	72	2,200	60	36.7	73,400 / 9,800	172,000 / 23,000	4,687	22.9	53.7	Wells35; AG&M	
22	B(26-17) 23CCC1	600495	353708114042101		BIG WELL Neal #1	428		72	2,200	68	32.4	64,700 / 8,700			20.2		GWSI	
23	B(26-17) 23CDD	086253			RL-1, CER-3	492	3/16/1981		1,500	70	21.4	42,800 / 5,700	17,400 / 2,300	813	11.6	4.7	Wells55; AG&M	
24	B(26-17) 23CDD	086253			RL-1, CER-3	492	12/29/2005	24	1,052	142	7.4	14,800 / 2,000	32,500 / 4,400	4,392	4.0	8.8	M&A	DD = 43,900 gpd/ft RC = 21,000 gpd/ft
25	B(26-17) 35AAA	600500			Neal #2	294			1,500	134	11.2	22,400 / 3,000			10.2		AG&M	
26	B(26-18) 01BBB	800243		13914	35-48174	90	5/12/1979		8	2	4.0	8,000 / 1,100			11.9		Wells35	
27	B(26-18) 01BDB	800243	354018114094201		35-48174	110	5/21/1980	1	8	6	1.3	2,700 / 400			3.3		GWSI	
28	B(26-18) 03AAA	641124		13915	35-78021	100			12	1	12.0	24,000 / 3,200			32.1		Wells35	
29	B(26-18) 03BAA			13916	35-47611	80			7	7	1.0	2,000 / 300			3.3		Wells35	
30	B(26-18) 05DDB	603219		13917	35-68910	100			11	20	0.6	1,100 / 100			1.5		Wells35	
31	B(27-17) 05ADC	587689				85	9/25/2001		10	20	0.5	1,000 / 100			1.6		Wells55	
32	B(27-17) 19CDA	600504		13936		110			90	2	45.0	90,000 / 12,100			109.4		Wells35	
33	B(27-17) 23CAC	640651		13937	RL-2	215	2/9/2005	24	1,679	34	49.4	98,800 / 13,200	190,000 / 25,500	3,846	61.4	118.0	Wells35; M&A	DD = 240,000 gpd/ft RC = 140,000 gpd/ft
34	B(28-17) 07DDD	212229			H-4	503	8/18/2006	4	221	51.1	4.3	8,600 / 1,200	10,800 / 1,400	2,497	2.3	2.8	CCA	
35	B(28-17) 31AAA	208801			Stockton Hill	435	12/29/2005	6	234	59	4.0	8,000 / 1,100	6,200 / 800	1,550	2.5	1.9	CCA	
36	B(28-17) 31CCC	208802			Kathy	63	12/6/2005	5	210	35	6.0	12,000 / 1,600	8,600 / 1,200	1,433	25.6	18.4	CCA	
37	B(28-17) 31DDD	208803			Elmo-1	608	10/23/2005	5	200	9	22.3	44,600 / 6,000	117,000 / 15,700	5,247	9.8	25.7	CCA	
38	B(28-18) 01CDD	212232			H-2	88	7/16/2006	4.08	222	27.3	8.1	16,300 / 2,200	58,600 / 7,900	7,193	24.7	47.3 [3]	CCA	
39	B(28-18) 13CDA	203012				162	7/26/2004	24	42	20	2.2	4,400 / 600			3.6		Wells55	
40	B(28-18) 13DCB	208805			Pocket-A	490	10/27/2005	3	223	46	4.8	9,600 / 1,300	19,900 / 2,700	4,146	2.6	5.4	CCA	
41	B(28-18) 25AAA	212227			H-5	117	8/26/2006	4	221	10.6	20.9	41,900 / 5,600	87,000 / 11,700	4,153	48.1	100.4	CCA	
42	B(29-18) 13BBA	208804			H-3	270	7/25/2006	6.32	256	197.7	1.3	2,600 / 300	6,800 / 900	5,251	1.3	3.5	CCA	
43	B(29-18) 25BCD	212231			H-1	716	8/6/2006	3.33	273	29.3	9.3	18,600 / 2,500	42,400 / 5,700	4,551	3.5	8.0	CCA	

Notes:

1) Transmissivity calculated from specific capacity based on the empirical relationship in Driscoll (1986) (explained in the text) using a constant of proportionality of 2,000 gpd/gpm.

2) Wells H-1 through H-5 are associated with the proposed Mardian Ranch development.

3) Reported by Clear Creek and Associates for Mardian Ranch Analysis of Adequate Water Supply application

Abbreviations:

AG&M = Arcadis G&M, Inc., 2002
ADWR = Arizona Department of Water Resources
ASLD = Arizona State Land Department
CCA = Clear Creek Associates and Golder Associates, 2006
DD = Transmissivity estimated from water-level drawdown data
ft = feet
G&B = Gillespie and Bentley, 1971
gpm = gallons per minute
gpd/ft = gallons per day per foot
GWSI = Groundwater Site Inventory (maintained by ADWR)
M&A = Errol L. Montgomery & Associates, Inc.
RC = Transmissivity estimated from water-level recovery data
S.C. = Specific Capacity
T = Transmissivity
Wells35 = pre-1980 well registry system created by the Arizona State Land Department
Wells55 = current ADWR registry of wells

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TABLE 2. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2042, HUALAPAI VALLEY MODEL

CADASTRAL LOCATION OR MODEL WELL NAME	COMPLETION DATE	LOCATION COORDINATES*		SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET																																										
		EASTING (feet)	NORTHING (feet)	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 – 2042
Existing Kingman-Area Production Wells:																																																
B(22-16) 28BDA	12/3/1982	429,681.93	1,551,626.34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	119.9	239.8	359.6	479.5	599.4	719.2	839.1	959.	1,078.9	1,198.8	1,318.6	1,438.5	1,558.4	1,678.2	1,798.1	1,918.	2,037.9	2,157.8	2,277.6	2,397.5	2,517.4	2,637.2	2,757.1	2,877.	2,988.6	3,100.3	3,212.	3,323.6	3,435.3	3,546.9	3,658.6	3,770.2	3,881.9
B(22-16) 29AAA	2/6/1991	427,046.37	1,559,011.43	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	75.5	151.1	226.6	302.1	377.7	453.2	528.7	604.2	679.8	755.3	830.9	906.4	981.9	1,057.5	1,133.	1,177.	1,220.9	1,264.9	1,308.9	1,352.8	1,396.8	1,440.8	1,484.8	1,528.7
B(22-16) 32DDD	06/14/2002	427,107.05	1,542,867.93	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	414.	828.	1,242.	1,656.	1,720.3	1,784.5	1,848.8	1,913.1	1,977.3	2,041.6	2,105.9	2,170.1	2,234.4
B(22-16) 33CDC	1/1/1971	428,915.42	1,542,832.77	0.	26.7	53.5	80.2	107.	133.7	160.5	187.2	213.9	240.7	267.4	294.2	320.9	347.7	374.4	401.1	427.9	454.6	481.4	508.1	534.9	561.6	588.3	615.1	641.8	668.6	695.3	722.1	748.8	775.5	802.3	829.	855.8	882.5	909.3	936.	972.3	1,008.6	1,045.	1,081.3	1,117.6	1,153.9	1,190.3	1,226.6	1,262.9
B(22-16) 33BCD	1/1/1988	428,423.19	1,545,561.39	0.	14.5	29.	43.5	58.1	72.6	87.1	101.6	116.1	130.6	145.1	159.7	174.2	188.7	203.2	217.7	232.2	246.7	261.3	275.8	290.3	304.8	319.3	333.8	348.3	362.9	377.4	391.9	406.4	420.9	435.4	449.9	464.5	479.	493.5	508.	527.7	547.4	567.1	586.9	606.6	626.3	646.	665.7	685.4
B(22-16) 15CCC	10/10/1974	433,097.36	1,558,693.87	0.	0.	0.	0.	16.1	32.1	48.2	64.3	80.3	96.4	112.4	128.5	144.6	160.6	176.7	192.8	208.8	224.9	240.9	257.	273.1	289.1	305.2	321.3	337.3	353.4	369.4	385.5	401.6	417.6	433.7	449.8	465.8	481.9	497.9	514.	533.9	553.8	573.8	593.7	613.7	633.7	653.6	673.6	693.5
B(22-16) 21BBD	1/1/1972	417,388.83	1,558,090.68	0.	0.	37.7	75.4	113.1	150.8	188.5	226.2	263.9	301.6	339.3	377.1	414.8	452.5	490.2	527.9	565.6	603.3	641.	678.7	716.4	754.1	791.8	829.5	867.2	904.9	942.6	980.3	1,018.1	1,055.8	1,093.5	1,131.2	1,168.9	1,206.6	1,244.3	1,282.	1,331.7	1,381.5	1,431.2	1,481.	1,530.8	1,580.5	1,630.3	1,680.	1,729.8
B(22-16) 27DDD	8/28/1958	437,966.65	1,547,764.62	0.	0.2	0.3	0.5	0.7	0.9	1.	1.2	1.4	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.7	2.9	3.1	3.3	3.4	3.6	3.8	3.9	4.1	4.3	4.5	4.6	4.8	5.	5.1	5.3	5.5	5.7	5.8	6.	6.2	6.5	6.7	6.9	7.2	7.4	7.6	7.9	8.1
B(22-16) 34CBC	4/5/1978	433,103.11	1,544,172.84	0.	0.	0.	0.	0.	0.	0.	0.	1.4	2.7	4.1	5.4	6.8	8.1	9.5	10.9	12.2	13.6	14.9	16.3	17.6	19.	20.4	21.7	23.1	24.4	25.8	27.1	28.5	29.9	31.2	32.6	33.9	35.3	36.6	38.	39.6	41.	42.4	43.9	45.4	46.8	48.3	49.8	51.3
Total Annual Pumping				0.	41.4	120.4	199.7	294.9	390.1	485.3	580.5	677.	773.6	870.1	966.7	1,183.1	1,399.6	1,616.	1,832.4	2,048.8	2,265.1	2,481.7	2,698.1	2,914.6	3,206.5	3,498.5	3,790.5	4,082.4	4,374.4	4,666.3	4,958.3	5,250.3	5,542.2	5,834.2	6,126.2	6,832.1	7,538.1	8,244.	8,950.	9,297.3	9,644.7	9,992.	10,339.3	10,686.7	11,034.	11,381.3	11,728.7	12,076.
Existing Domestic Wells:																																																
B(21-15) 05BBB-R	9/20/2001	453,618.96	1,542,658.22	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(21-16) 03CCA	4/5/2005	433,690.84	1,538,338.31	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(21-16) 03BAB	3/28/2008	434,362.30	1,542,180.10	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-15) 09CAA	8/7/2002	461,394.12	1,565,882.48	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-15) 19CBB	1/1/1982	448,678.32	1,555,517.86	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-15) 23CCD-R	1/1/1965	462,777.00	1,563,272.89	0.	0.25	0.25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-15) 33BBB	2/12/1957	459,537.57	1,547,194.93	0.	0.25	0.25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-15) 33DBD-R	9/12/2000	458,765.59	1,544,117.84	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-15) 33CCC-R	3/18/2002	454,954.75	1,542,710.36	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 02ABD	3/12/2005	441,889.85	1,573,101.94	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 03CBA	12/11/1979	433,192.89	1,571,483.52	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 03CBB	5/30/1980	433,183.49	1,571,234.44	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 05DBA	1/1/1980	425,840.26	1,571,262.33	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 06DBA-	11/26/2005	419,671.40	1,571,278.47	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 07ADD	4/9/1974	421,925.07	1,566,687.28	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 07DAA	10/17/1987	422,008.92	1,566,304.53	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 07DCC	8/4/2002	416,486.97	1,564,025.44	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 07ABD	4/1/2005	419,554.71	1,567,961.44	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 10CAA	10/15/2005	438,078.71	1,565,952.08	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 15CCC	10/4/1974	433,064.30	1,558,775.26	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 15AAB	1/1/1980	437,046.67	1,563,388.73	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 15CCC	8/11/1983	433,097.36	1,558,692.87	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 15CCA	11/30/1998	432,804.26	1,559,286.10	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 17DDD	7/5/2002	427,046.37	1,559,011.43	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 17DDD	7/12/2002	427,128.33	1,558,706.48	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 19BAA	6/1/1973	417,388.83	1,558,090.68	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 20CBC	11/10/1987	422,509.85	1,554,755.79	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 20DAA	8/6/2002	427,126.34	1,556,418.54	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 20CBC	5/10/2004	422,509.85	1,554,755.79	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 26BAC	6/1/1957	439,052.32	1,551,908.20	0.	0.25	0.25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 27DDD	11/15/1973	437,966.65	1,547,764.62	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 28BBA	11/30/1986	426,528.92	1,562,472.26	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 28CDA	11/21/2000	429,763.96	1,551,824.33	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 28BDA	2/2/2001	429,681.93	1,551,626.34	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 29AAA	10/5/1990	427,127.56	1,552,774.73	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 29AAA	11/30/1996	417,706.93	1,558,016.86	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 29AAA	9/8/2004	427,032.32	1,552,765.44	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 32DDD	1/1/2006	427,107.06	1,542,457.93	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 32DDD	1/1/2006	427,107.05	1,542,867.93	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 33BCD	6/15/1973	428,423.19	1,545,561.39	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 33CDC	10/7/1974	428,915.43	1,542,832.77	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 33CCD	9/16/2002	428,432.42	1,542,862.03	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 34CBC	1/1/1980	433,103.11	1,544,172.84	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(22-16) 34BCA	8/30/2000	433,711.43	1,546,134.44	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-14) 03ADD	4/17/1998	508,771.52	1,683,443.78	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-14) 05AAA-R	12/11/1980	498,496.24	1,686,974.78	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-15) 14CCC-R	11/15/1973	464,089.39	1,588,937.01	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-15) 30CBB	12/5/1979	446,769.68	1,581,966.99	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-15) 35BAB-R	1/5/2004	470,715.84	1,578,426.29	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-16) 03BBD	11/16/2005	433,813.78	1,604,912.95	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-16) 09ADA-R	6/1/1972	432,662.82	1,589,432.87	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-16) 09DAB-R	12/5/1979	434,010.10	1,587,850.42	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-15) 16DDB-R	2/2/1973	435,818.14	1,590,655.88	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(23-16) 33CCC-R	1/25/2003	427,763.14	1,573,962.95	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-14) 09CBB-R	10/8/2002	490,509.55	1,628,620.69	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-14) 19ABD-R	9/12/2002	487,897.17	1,620,524.38	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-14) 28DBC	4/6/1997	493,625.97	1,612,690.28	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-14) 29AAB	1/1/1980	489,837.55	1,616,091.20	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-14) 29BAD-R	3/3/1996	490,536.83	1,615,201.77	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-14) 29AAA	1/16/1997	490,881.14	1,616,422.02	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-14) 29ABA	3/16/2005	489,375.94	1,618,246.45	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-14) 29BBA	1/12/2006	489,276.88	1,616,643.77	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-14) 33AAD	2/1/1998	495,484.72	1,610,811.67	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 01BCC	5/23/2004	475,325.46	1,635,586.68	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 05CBD	11/30/1988	454,830.45	1,634,126.05	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 05BBC	10/26/2004	454,176.26	1,637,115.94	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 05DAC	4/19/2005	457,540.67	1,633,630.24	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 11CBB-R	1/1/1980	469,507.82	1,629,714.74	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 11BCA-R	1/12/1990	469,408.79	1,630,679.11	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 11BAA-R	2/15/2006	469,388.49	1,631,954.56	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 13ADA-R	1/1/1980	481,373.78	1,628,770.73	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 16BBB	11/30/1998	448,917.21	1,626,526.06	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 27CCC-R	1/3/2006	464,201.19	1,611,549.40	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 28DDD-R	8/26/1978	464,099.20	1,611,470.53	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 28CCA	1/1/1980	460,111.85	1,612,117.28	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 28CAC	4/13/2004	460,775.67	1,612,762.91	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 32BBD	7/20/1981	454,979.40	1,609,710.87	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 32ACA	4/11/1982	457,718.14	1,609,836.82	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-15) 33BBB	1/6/1975	459,159.94	1,610,545.78	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 07CAA-R	1/1/1980	415,445.13	1,629,398.81	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 08BDB-R	1/1/1978	423,489.17	1,631,010.34	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 08DCA-R	1/1/1980	427,236.02	1,626,444.49	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 08ACA	10/9/1989	425,924.90	1,630,692.41	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 10CAA	3/1/2001	434,778.40	1,629,087.90	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 10AAA	9/6/2001	437,937.46	1,632,357.60	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 11DDD	6/4/1985	442,830.53	1,627,231.46	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 19ADC	3/15/2001	421,375.18	1,621,012.62	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 25ABA-R	8/30/2002	441,531.11	1,616,275.03	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 25CDB-R	12/6/2005	437,859.48	1,612,537.96	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 34DDB-R	1/1/1980	436,082.10	1,606,829.26	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 34CAD	1/1/1980	436,184.26	1,607,557.52	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(24-16) 34BDA	9/6/2001	435,141.41	1,609,538.01	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(25-16) 23BBB	3/23/2001	434,235.72	1,648,906.04	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(25-16) 30CCB	7/13/1995	413,479.26	1,644,629.72	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(25-16) 31ACB	12/8/2005	415,927.62	1,641,953.26	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(25-17) 13AAA	5/10/2001	412,901.88	1,659,375.50	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(25-17) 23BCA-R	2/2/1981	407,440.27	1,652,814.88	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(25-17) 23BDD-R	1/1/2005	407,586.39	1,651,757.29	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B(26-16) 16AA	5/12/2001	419,460.26	1,689,105.40	0.	0.	0.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

MONTGOMERY & ASSOCIATES

TABLE 2. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2042, HUALAPAI VALLEY MODEL

SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET

CADASTRAL LOCATION OR MODEL WELL NAME	COMPLETION DATE	LOCATION COORDINATES* EASTING (feet)	NORTHING (feet)	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
B(26-16) 26C	3/7/2008	436,265.00	1,676,575.21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-16) 27ABD	4/20/1995	400,402.18	1,679,477.52	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-16) 28DDC	3/20/1993	427,993.74	1,675,479.60	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-16) 29BBB	2/6/1991	416,627.76	1,680,294.27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-16) 29BBB	1/27/1992	417,300.93	1,679,806.91	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-16) 28DDD	7/16/1992	423,296.65	1,675,604.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-16) 29DDD	12/15/1992	423,238.87	1,676,462.20	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-16) 30DDD	8/31/1999	416,168.70	1,676,606.58	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-17) 23CCC	2/1/1978	404,146.15	1,660,707.03	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CDD	8/20/1999	405,095.51	1,680,773.94	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-17) 23CBB	11/4/1999	402,586.76	1,682,936.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-17) 25BBB	2/16/1999	405,602.93	1,696,894.61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-17) 27ACA	10/1/1966	401,088.27	1,679,401.21	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 35AAA	1/1/1959	409,755.10	1,670,152.84	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 01BDB-R	7/20/1990	377,549.70	1,703,827.38	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 03BDB	1/1/1980	367,283.84	1,700,289.67	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03ADD	12/19/2005	370,582.36	1,699,617.87	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 06DBB-R	11/2/1989	359,005.29	1,699,731.37	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 08DCB	6/25/2004	358,034.76	1,697,701.84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 09CAD	1/1/1980	362,556.01	1,693,056.79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09DBC	6/12/1981	363,317.67	1,693,051.39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(26-18) 17AAC	6/25/1981	359,340.52	1,690,427.64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(27-16) 26CBD	2/20/1995	424,467.87	1,708,683.65	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(27-16) 29CCD	1/1/1993	419,166.43	1,707,352.53	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(27-17) 05ADC	1/1/1980	391,064.18	1,731,253.77	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 06ADC	10/20/1980	391,067.37	1,731,257.14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 13ABD	1/17/1994	410,238.32	1,721,801.94	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(27-17) 23CAC	10/20/1977	403,317.86	1,714,251.10	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-16) 07ADD	9/1/1968	389,154.88	1,749,712.73	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31DDD	10/5/1957	386,483.26	1,733,906.05	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31CCC	1/1/1963	382,470.05	1,734,343.00	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31AAA	12/11/1979	386,481.23	1,738,521.56	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13DCB	6/1/1957	379,200.74	1,750,387.40	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13CDA	1/1/1980	378,706.30	1,750,393.15	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(29-18) 01CCC	8/3/1979	375,607.77	1,792,432.26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total Annual Pumping				0.	2.52	2.53	3.77	4.53	4.78	4.78	5.03	5.53	6.79	10.82	11.82	12.33	12.58	12.58	12.83
Simulated Other Committed Demand (OCD) Wells:																			
OCD 1	1/1/2007	431,709.41	1,675,222.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 2	1/1/2007	431,917.25	1,668,987.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 3	1/1/2007	425,030.70	1,654,059.67	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 4	1/1/2007	422,421.37	1,648,841.21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 5	1/1/2007	415,845.85	1,650,406.81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 6	1/1/2007	417,423.92	1,656,356.09	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 7	1/1/2007	410,522.81	1,658,443.55	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T27N	1/1/2007	425,356.39	1,762,887.35	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-LMNRA	1/1/2007	376,358.11	1,787,385.54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T29N	1/1/2007	375,358.01	1,771,290.71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T29N-2	1/1/2007	376,356.96	1,767,265.76	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T26N	1/1/2007	436,358.35	1,684,780.99	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T26N-2	1/1/2007	436,358.37	1,680,757.10	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T28Na	1/1/2007	381,038.51	1,752,449.73	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Total Annual Pumping				0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Simulated Model Production Wells:																			
HVS-1	1/1/2013	420,783.01	1,681,611.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
HVS-2	1/1/2013	428,419.53	1,675,427.92	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
HVS-3	1/1/2013	420,975.06	1,675,524.34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
HVS-4	1/1/2013	414,097.02	1,675,179.39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Total Annual Pumping				0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Annual Grand Total				0.	43.9	123.1	201.5	290.4	314.8	490.1	585.5	682.8	786.4	881.	978.5	1,195.5	1,412.1	1,628.6	1,845.3

CADASTRAL LOCATION OR MODEL WELL NAME	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
B(26-16) 26C	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 27ABD	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 28DDC	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 28DDD	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 30DDD	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CDD	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CBB	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 25BBB	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 27ACA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 35AAA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 01BDB-R	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(26-18) 03BDB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03ADD	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(26-18) 06DBB-R	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 08DCB	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25
B(26-18) 09CAD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09DBC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 17AAC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 26CBD	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 29CCD	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 05ADC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 06ADC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 13ABD	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 23CAC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-16) 07ADD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31AAA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13DCB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13CDA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(29-18) 01CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total Annual Pumping	12.83	13.08	13.08	13.84	14.59	14.84	15.6	16.1	16.35	17.11	17.36	18.11	19.07	20.88	21.88	24.15	26.44	27.17	28.93	31.95
Simulated Other Committed Demand (OCD) Wells:																				
OCD 1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 6	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OCD 7	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T27N	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-LMNRA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T29N	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T29N-2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T26N	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T26N-2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CD-T28Na	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Total Annual Pumping	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Simulated Model Production Wells:																				
HVS-1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
HVS-2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
HVS-3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
HVS-4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Total Annual Pumping	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Annual Grand Total	2,061.7	2,278.3	2,494.9	2,712.	2,929.2	3,221.4	3,514.1	3,806.6	4,098.8	4,391.5	4,683.7	4,976.4	5,270.1	5,563.1	5,856.1	6,150.3	6,858.8	7,565.2	8,273.	8,981.9

CADASTRAL LOCATION OR MODEL WELL NAME	2006	2007	2008	2009	2010	2011	2012	2013	2014 - 2042
B(26-16) 26C	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 27ABD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 28DDC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 28DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 30DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 25BBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 27ACA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 35AAA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 01BDB-R	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03BDB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03ADD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 06DBB-R	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 08DCB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09CAD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09DBC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 17AAC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 26CBD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 29CCD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 05ADC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 06ADC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 13ABD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 23CAC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-16) 07ADD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31AAA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13DCB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13CDA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(29-18) 01CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total Annual Pumping	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71
Simulated Other Committed Demand (OCD) Wells:									
OCD 1	300.	300.	300.	300.	300.	300.	300.	300.	300.
OCD 2	300.	300.	300.	300.	300.	300.	300.	300.	300.
OCD 3	300.	300.	300.	300.	300.	300.	300.	300.	300.
OCD 4	300.	300.	300.	300.	300.	300.	300.	300.	300.
OCD 5	300.	300.	300.	300.	300.	300.	300.	300.	300.
OCD 6	300.	300.	300.	300.	300.	300.	300.	300.	300.
OCD 7	300.	300.	300.	300.	300.	300.	300.	300.	300.
CD-T27N	116.2	116.2	116.2	116.2	116.2	116.2	116.2	116.2	116.2
CD-LMNRA	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
CD-T29N	322.8	322.8	322.8	322.8	322.8	322.8	322.8	322.8	322.8
CD-T29N-2	345.4	345.4	345.4	345.4	345.4	345.4	345.4	345.4	345.4
CD-T26N	322.8	322.8	322.8	322.8	322.8	322.8	322.8	322.8	322.8
CD-T26N-2	292.1	292.1	292.1	292.1	292.1	292.1	292.1	292.1	292.1
CD-T28Na	365.7	365.7	365.7	365.7	365.7	365.7	365.7	365.7	365.7
Total Annual Pumping	3,693.3	3,693.3	3,693.3	3,693.3	3,693.3	3,693.3	3,693.3	3,693.3	3,693.3
Simulated Model Production Wells:									
HVS-1	0.	0.	0.	0.	0.	0.	0.	750.	750.
HVS-2	0.	0.	0.	0.	0.	0.	0.	750.	750.
HVS-3	0.	0.	0.	0.	0.	0.	0.	750.	750.
HVS-4	0.	0.	0.	0.	0.	0.	0.	750.	750.
Total Annual Pumping	0.	0.	0.	0.	0.	0.	0.	3,000.	3,000.
Annual Grand Total	13,224.3	13,571.6	13,919.	14,266.3	14,613.6	14,961.	15,308.3	18,655.6	19,003.

* = Location coordinates are State Plane, U.S. feet, Arizona West, North American Datum 1927
"-R" = Relocated Well. Well is located in the Hualapai Valley, but outside the active area for model.
Well was relocated to the nearest active cell.

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ILLUSTRATIONS

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ILLUSTRATIONS

Figure

1 LOCATION MAP FOR HUALAPAI GROUNDWATER BASIN

2 GEOLOGIC MAP OF HUALAPAI VALLEY

3 HYDROGEOLOGIC SECTION A-A'

4 HYDROGEOLOGIC SECTION B-B'

5 HYDROGEOLOGIC SECTION C-C'

6 NUMERICAL MODEL CELL GRID

7 AQUIFER TRANSMISSIVITY AND HYDRAULIC CONDUCTIVITY

8 ALTITUDE OF BASE OF MODEL LAYER 1

9 SIMULATED 2006 INITIAL SATURATED THICKNESS IN MODEL LAYER 1

10 HYDRAULIC CONDUCTIVITY AND SPECIFIC YIELD, MODEL LAYER 1

11 ALTITUDE OF BASE OF MODEL LAYER 2

12 SIMULATED 2006 INITIAL SATURATED THICKNESS IN MODEL LAYER 2

13 HYDRAULIC CONDUCTIVITY AND SPECIFIC YIELD, MODEL LAYER 2

14 LOCATIONS FOR SIMULATED PUMPING WELLS

15 MAP OF SIMULATED RECHARGE DISTRIBUTION

16 SIMULATED AND OBSERVED GROUNDWATER LEVEL ALTITUDES PRE – 1970

17 GRAPH OF OBSERVED AND SIMULATED GROUNDWATER LEVEL ALTITUDES FOR 1970 STEADY-STATE CALIBRATION

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ILLUSTRATIONS (continued)

Figure

18 SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED – SIMULATED) DUE TO VARYING HORIZONTAL HYDRAULIC CONDUCTIVITY, STEADY-STATE SIMULATION

19 SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED – SIMULATED) DUE TO VARYING RATIO OF VERTICAL TO HORIZONTAL HYDRAULIC CONDUCTIVITY, STEADY-STATE SIMULATION

20 SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED – SIMULATED) DUE TO VARYING TOTAL RECHARGE, STEADY-STATE SIMULATION

21 SIMULATED AND OBSERVED GROUNDWATER LEVEL ALTITUDES OCT. 2005 THROUGH FEB. 2006

22a OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT IN KINGMAN SUB-BASIN

22b OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT IN KINGMAN SUB-BASIN

22c OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT IN KINGMAN SUB-BASIN

22d OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT NEAR LONG MOUNTAIN

22e OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT NEAR RED LAKE AREA

23 GRAPH OF OBSERVED AND SIMULATED GROUNDWATER LEVEL ALTITUDES FOR OCTOBER 2005 THROUGH FEBRUARY 2006, TRANSIENT CALIBRATION

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ILLUSTRATIONS (continued)

Figure

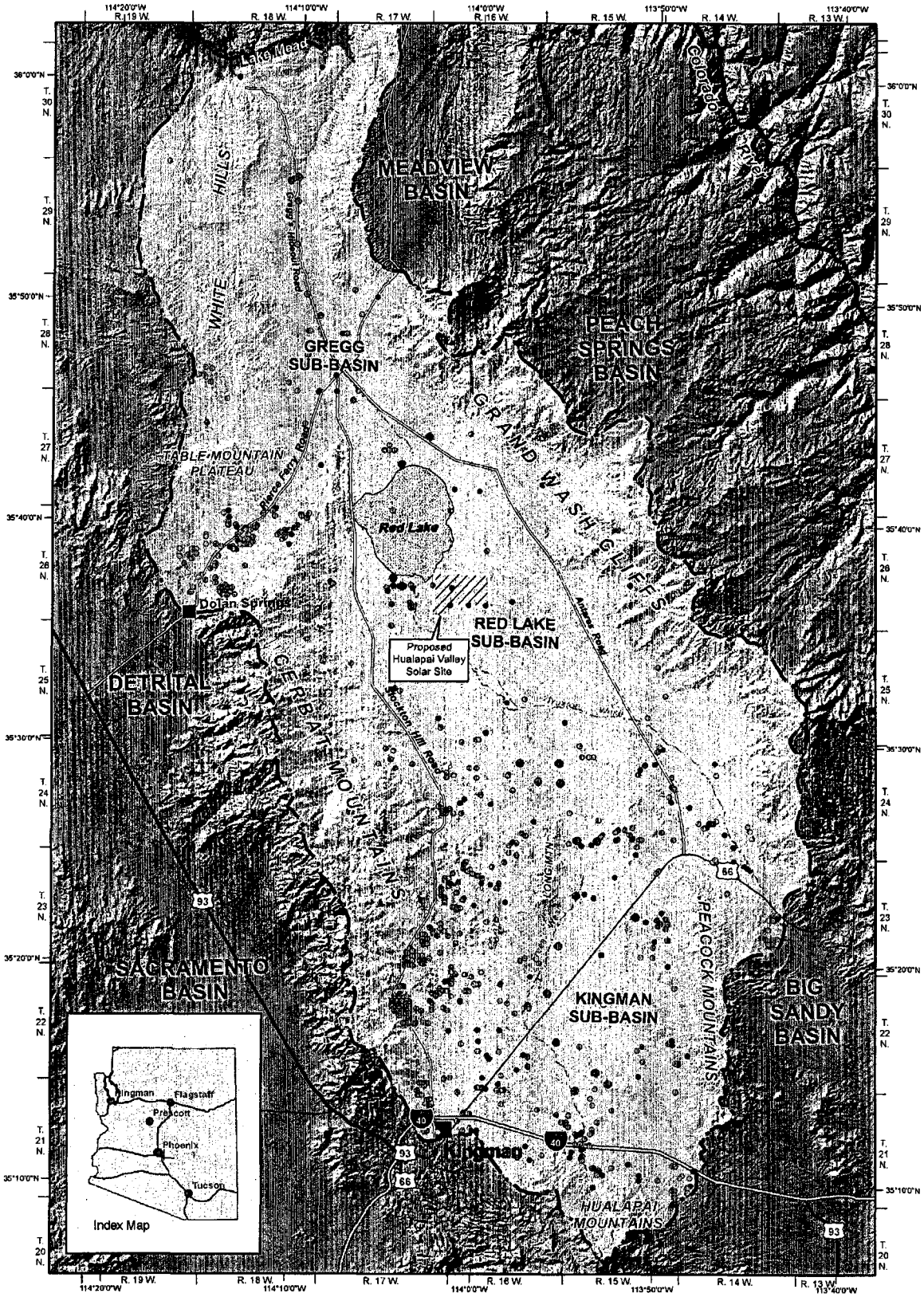
24 SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED – SIMULATED) DUE TO VARYING HORIZONTAL HYDRAULIC CONDUCTIVITY, TRANSIENT SIMULATION

25 SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED – SIMULATED) DUE TO VARYING SPECIFIC YIELD, TRANSIENT SIMULATION

26 SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED – SIMULATED) DUE TO VARYING STORAGE COEFFICIENT, TRANSIENT SIMULATION

27 PROJECTED GROUNDWATER LEVEL ALTITUDE AT END OF 2042

28 PROJECTED GROUNDWATER LEVEL DECLINE AT END OF 2042



EXPLANATION

- Well from ADWR Groundwater Site Inventory
- Well from ADWR 55 Registry Inventory
- Well from ADWR 35 Registry Inventory
- New Well or Existing Well Tested by Montgomery and Associates
- Well Inventoried by Montgomery & Associates
- Mardian Ranch Wells
- Groundwater Basin Boundary (ADWR, 2005a)
- Bedrock Boundary (AZGS, 1998; Remick, 1981; Gillespie and Bentley, 1971)

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

LOCATION MAP
FOR HUALAPAI
GROUNDWATER BASIN

MONTGOMERY & ASSOCIATES
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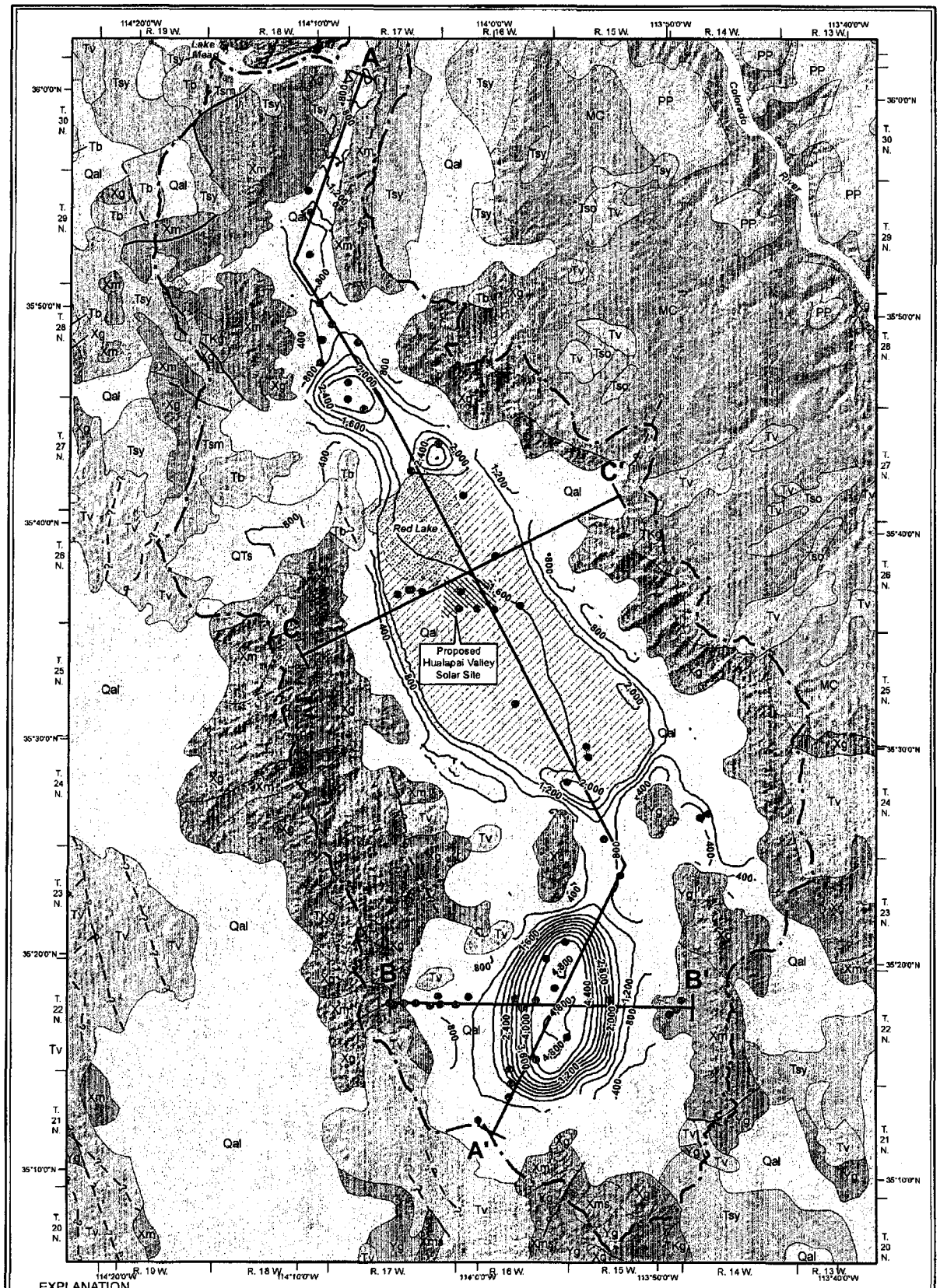
FIGURE 1

GIS-Tuc/1326.02/Figure_LocationMap.mxd/29July2009



EXPLANATION

Qal	Quaternary Alluvium
QTs	Quaternary-Tertiary Sandstone and Conglomerate
Tsy/Tsm/Tso	Pliocene-Miocene (Tsy), Miocene-Oligocene (Tsm), and Oligocene-Paleocene (Tso) Sedimentary Rocks
Tb/Tv	Tertiary Basaltic (Tb) and Other Volcanic (Tv) Rocks
TKg	Tertiary-Cretaceous Granitic Rocks
PP	*Permian-Pennsylvanian* Sandstone, Limestone, Dolomite
MC	Mississippian-Cambrian Sandstone, Limestone, Dolomite
Yg/Xg	Middle (Yg) - Lower (Xg) Proterozoic Granitic Rocks
Xm/Xms/Xmv	Lower Proterozoic Metamorphic (Xm), Metasedimentary (Xms), and Metavolcanic (Xmv) Rocks
	Extent of Evaporite Deposits (from ARCADIS, 2000)
●	Well Location
— —?—	High-angle Fault, queried where uncertain
———	*Low-angle Normal Fault*
—·—·—	Groundwater Basin Boundary (ADWR, 2005a)
——┤	Line of Section
—400—	Depth Contour, in feet, to Top of Bedrock or Evaporite Deposits (see text for basis)

(Geology modified from AZGS, 1998)

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

GEOLOGIC MAP OF HUALAPAI VALLEY

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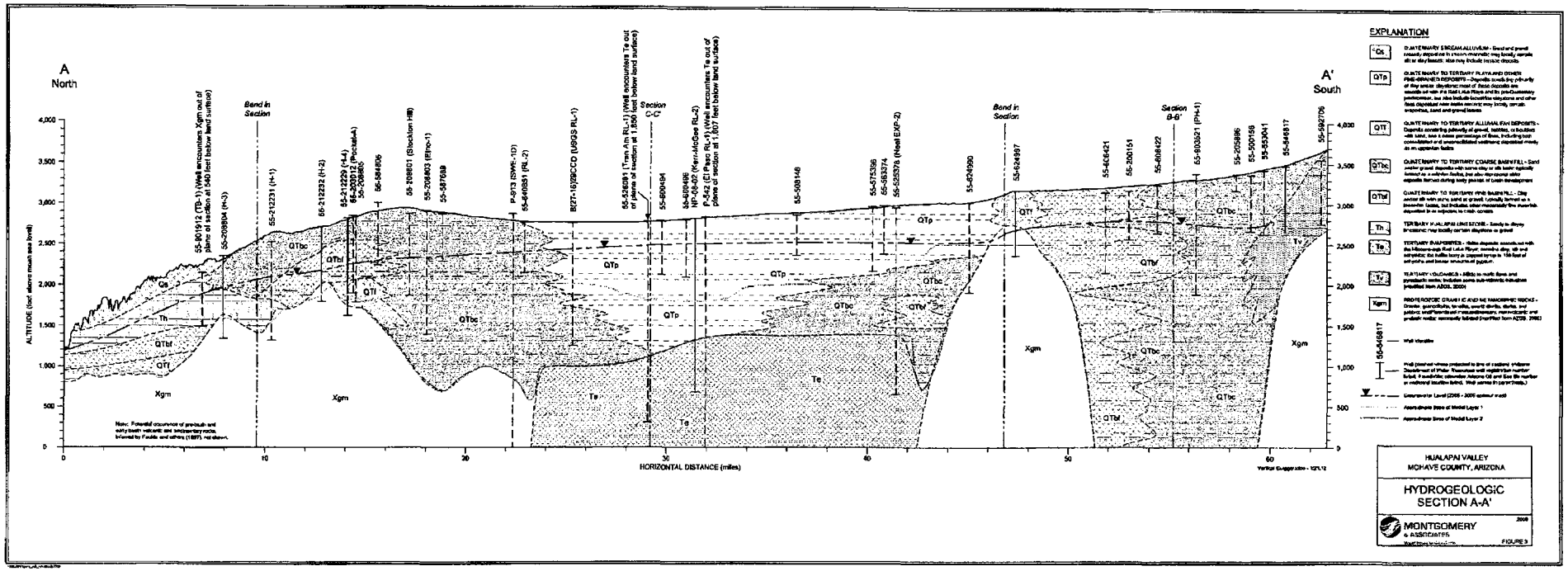
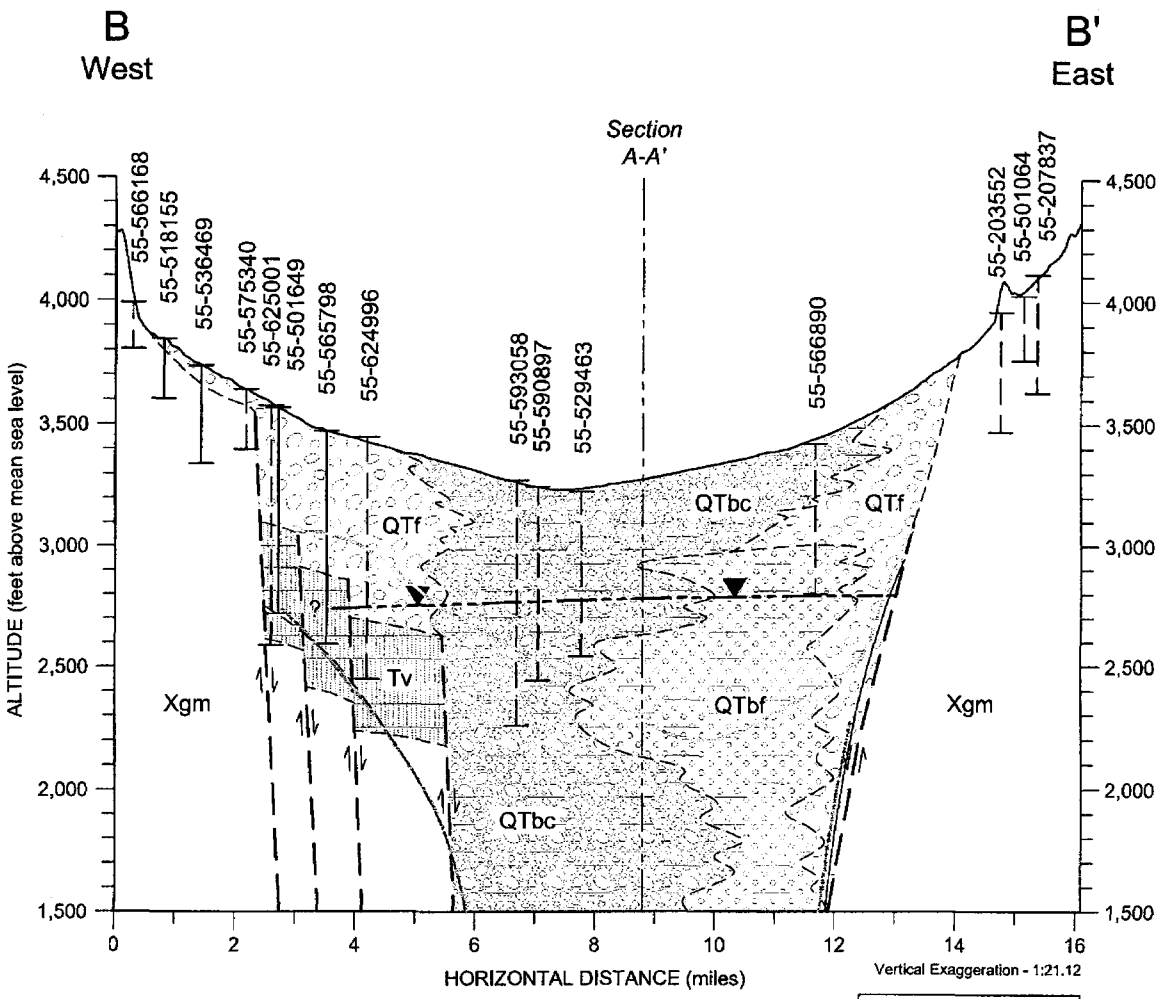
FIGURE 2

GIS-Tod1326.02\POSTER_GeoMap_ledger\29.July2009


A
North
A'
South
Bend in Section
Section C-C'
Section B-B'
ALTITUDE (feet above mean sea level)
HORIZONTAL DISTANCE (miles)
Vertical Exaggeration - 125:1
Qs
Th
QTbl
QTf
QTbc
QTbf
QTt
QTp
Xgm
Te
Tv
EXPLANATION
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA
HYDROGEOLOGIC SECTION A-A'
MONTGOMERY & ASSOCIATES
FIGURE 3



Note: Potential occurence of pre-basin and early basin volcanic and sedimentary rocks, inferred by Faulds and others (1997), not shown.

EXPLANATION

QTf — QUATERNARY TO TERTIARY ALLUVIAL FAN DEPOSITS - Deposits consisting primarily of gravel, cobbles, or boulders with sand, and a minor percentage of fines, including both consolidated and unconsolidated sediment; deposited mostly as an upper-fan facies

QTbc — QUATERNARY TO TERTIARY COARSE BASIN FILL - Sand and/or gravel deposits with some clay or silt beds; typically formed as a mid-fan facies, but also represents older deposits formed during early phases of basin development

QTbf — QUATERNARY TO TERTIARY FINE BASIN FILL - Clay and/or silt with some sand or gravel; typically formed as a lower-fan facies, but includes other moderately fine materials deposited in or adjacent to basin centers

Tv — TERTIARY VOLCANICS - Silicic to mafic flows and pyroclastic rocks; includes some sub-volcanic intrusions (modified from AZGS, 2000)

Xgm — *PROTEROZOIC GRANITIC AND METAMORPHIC ROCKS* - Granite, granodiorite, tonalite, quartz diorite, diorite, and gabbro; undifferentiated metasedimentary, metavolcanic and gneissic rocks; commonly foliated (modified from AZGS, 2000)

55-518155 — Well Identifier

Well (dashed where projected to line of section) (Arizona Department of Water Resources well registration number listed, if available; otherwise Arizona Oil and Gas file number or cadastral location listed. Well names in parenthesis.)

Groundwater Level (2005 - 2006 contour map)

Approximate Base of Model Layer 1

Approximate Base of Model Layer 2

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

HYDROGEOLOGIC SECTION B-B'

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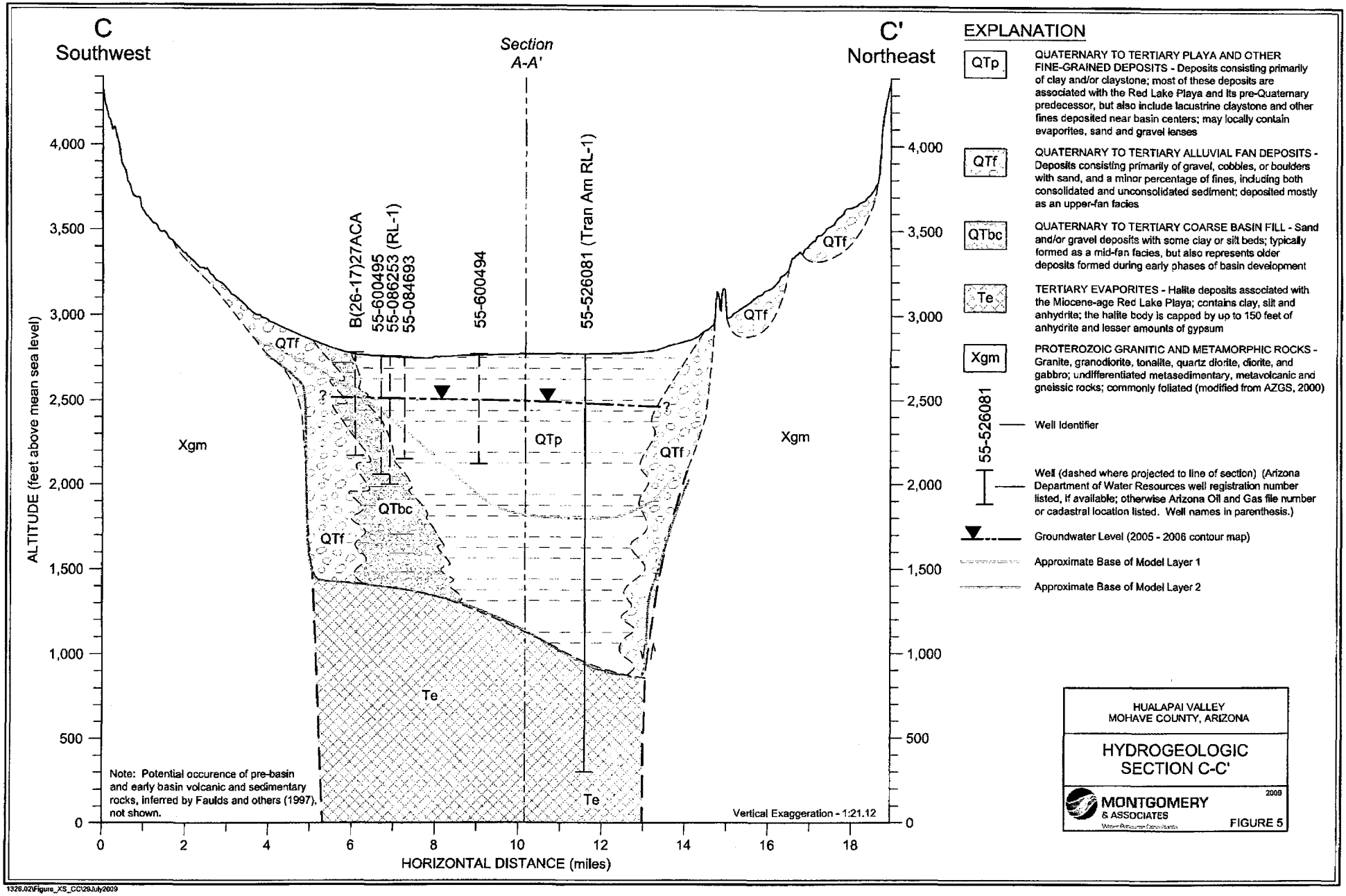
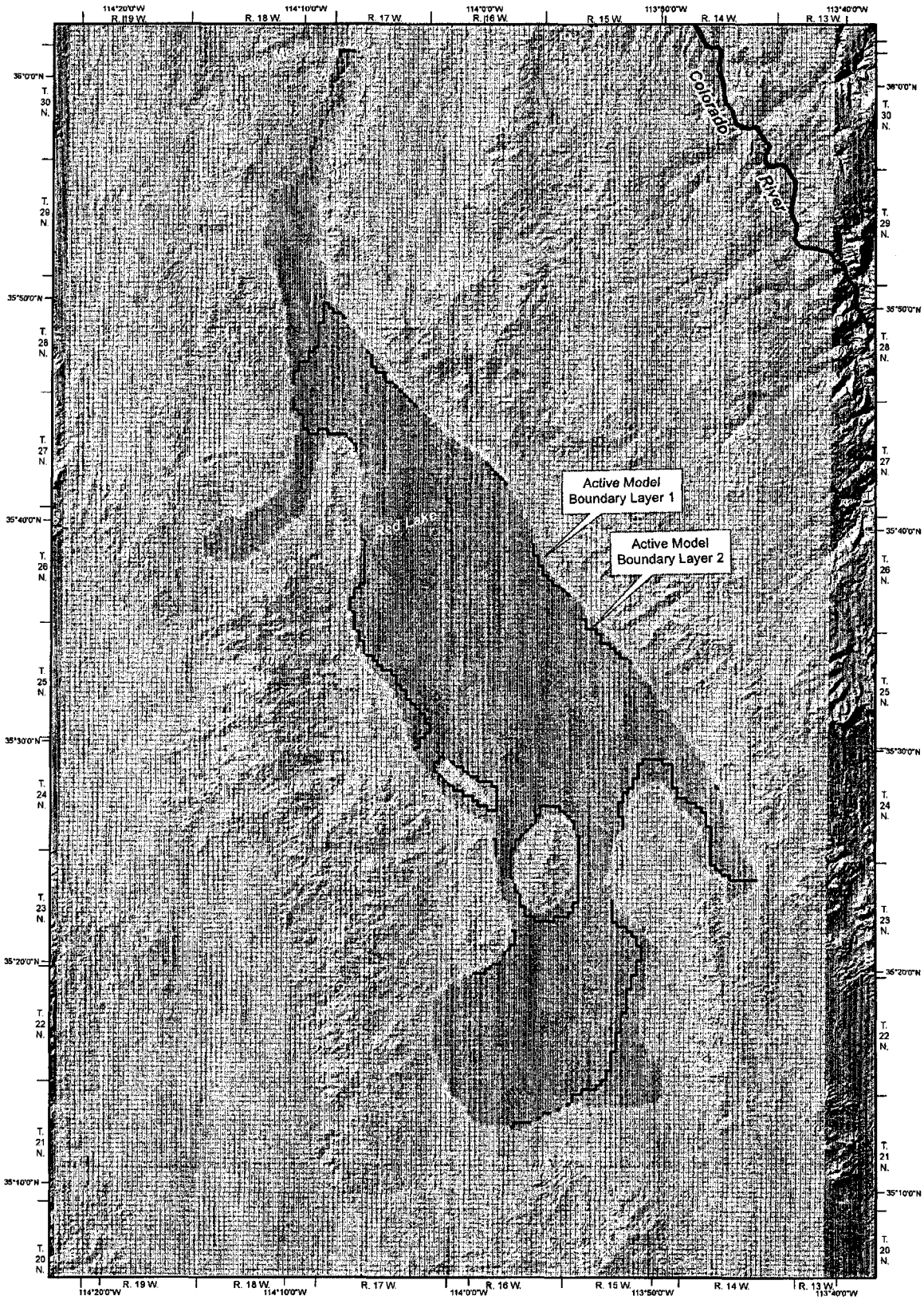
FIGURE 4

1326.02\Figure_XS_BB\29July2009



1326.02\Figure_XS_CC\29July2009



EXPLANATION

- Active Model Cell Layer 1
- Inactive Model Cell
- Constant Head Cell (at Lake Mead)
- Boundary of Active Model Cells Layer 1
- Boundary of Active Model Cells Layer 2

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

NUMERICAL MODEL CELL GRID

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FIGURE 6

GIS/1326.02/Figure_ModelGrid.mxd/29July2009

EXPLANATION

▲ Transmissivity reported by Montgomery & Associates

72,000 — Transmissivity, in gallons per day per foot
12.8 — Hydraulic Conductivity, in feet per day

3,000 / 1.0 □ Transmissivity calculated using specific capacity data

44,000 / 12.3 ● Transmissivity reported by others

Groundwater Basin Boundary (ADWR, 2005a)

Bedrock Boundary (AZGS, 1998; Remick, 1981; Gillespie and Bentley, 1971)

Note: Well identifications for transmissivity and hydraulic conductivity data are included in Table 1.

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

AQUIFER TRANSMISSIVITY AND HYDRAULIC CONDUCTIVITY

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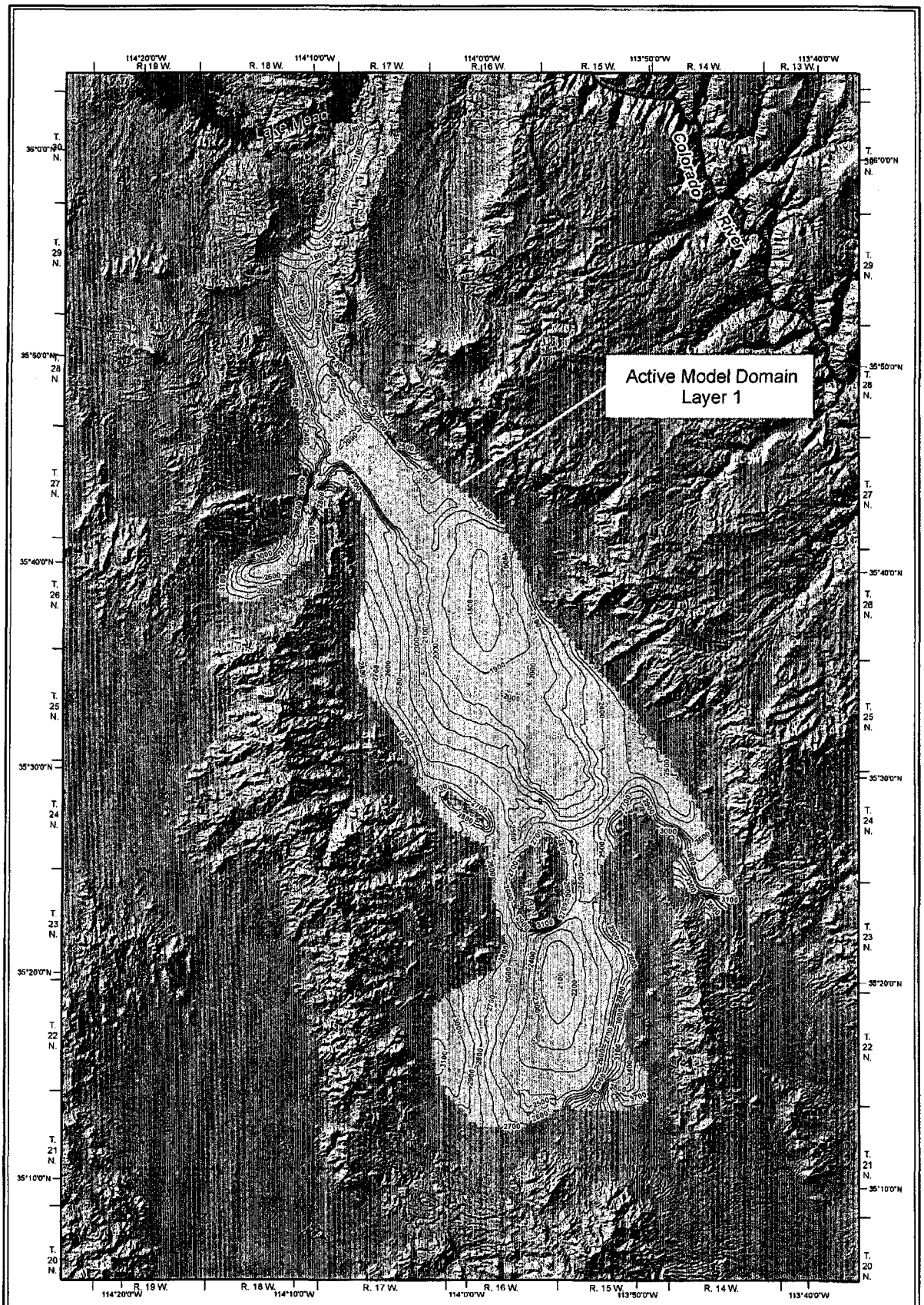
FIGURE 7

GIS/1326.02/Figure_ObsTransmissivity.mxd/29July2009



EXPLANATION

Altitude of Base of Model Layer 1, in feet above mean sea level

— 2,500 — Altitude Contour, in feet msl

- 501 - 1,000
- 1,001 - 1,500
- 1,501 - 2,000
- 2,001 - 2,500
- 2,501 - 3,000
- 3,001 - 3,500
- 3,501 - 4,000

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

ALTITUDE OF BASE OF MODEL LAYER 1

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Water for a future society

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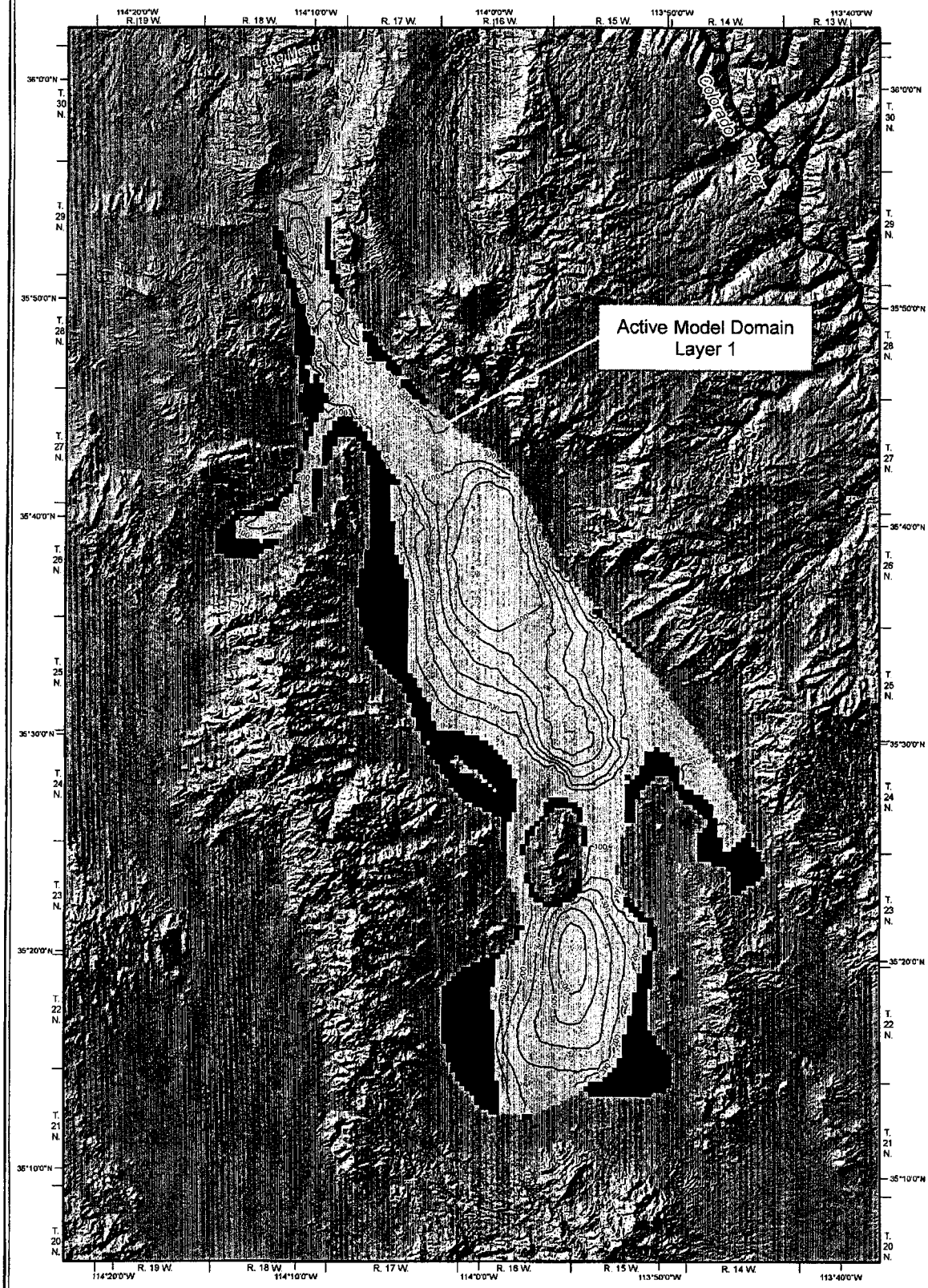
FIGURE 8

GIS/1326.027/Figure_BotLayer1.mxd/29July2009



EXPLANATION

Simulated initial saturated thickness in model layer 1, in feet.

— 500 — Saturated Thickness Contour, in feet

Dry Cells*

* Dry cells indicate groundwater level below the bottom of model layer 1.

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

SIMULATED 2006 INITIAL SATURATED THICKNESS IN MODEL LAYER 1

MONTGOMERY & ASSOCIATES

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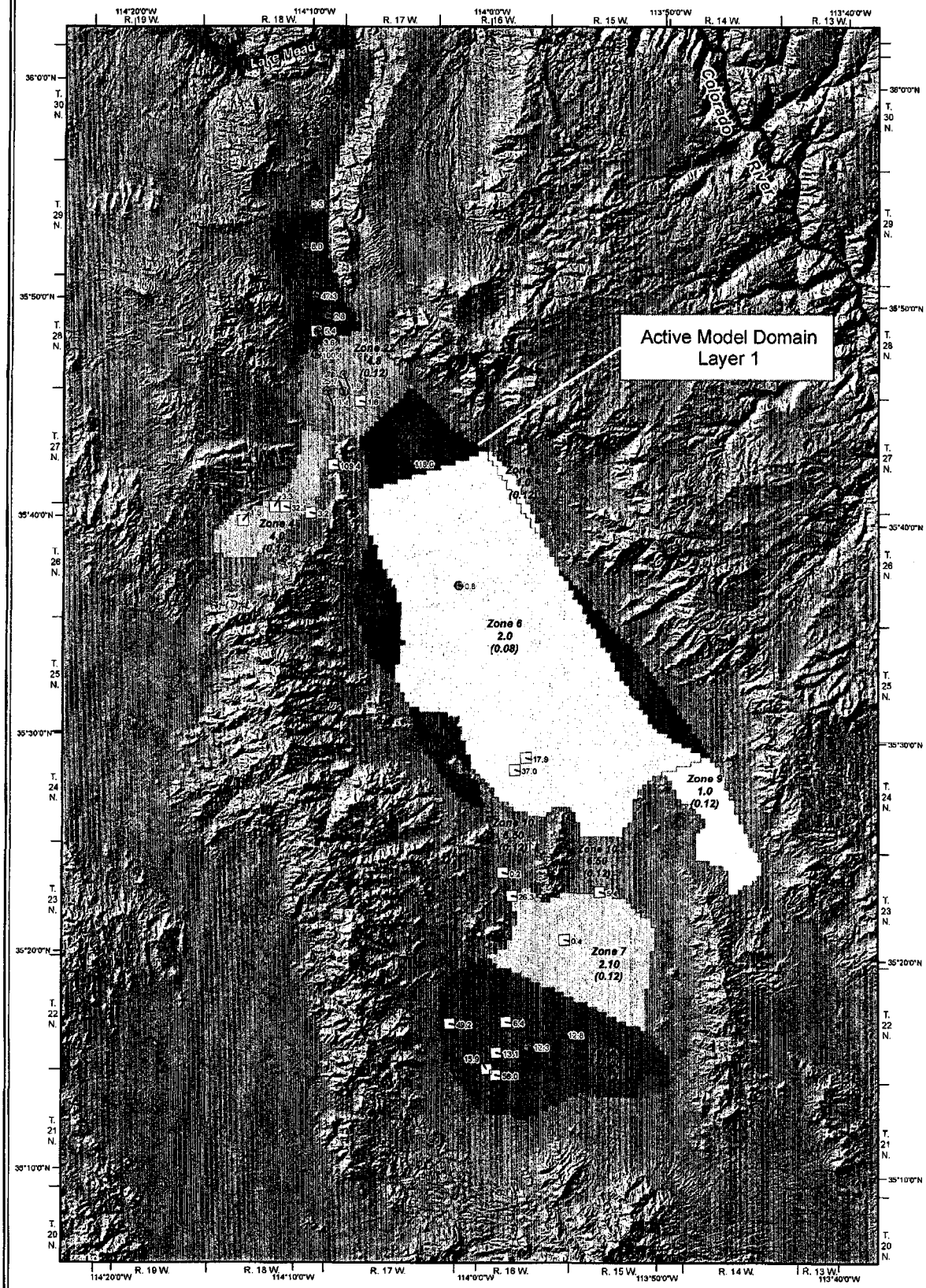
FIGURE 9

GIS/1326.027/Figure_SAT1_Initial.mxd/29July2009



EXPLANATION

12.8 ▲ Hydraulic Conductivity reported by Montgomery & Associates, in feet per day (ft/day)

13.1 □ Hydraulic Conductivity calculated using specific capacity data, in ft/day

12.3 ● Hydraulic Conductivity reported by others, in ft/day

Note: Well identifications for hydraulic conductivity data are included in Table 1.

Simulated Horizontal Hydraulic Conductivity, in feet per day

1.0	Zone 5		Zone 10
1.0	Zone 9		Zone 1
2.0	Zone 6		Zone 8
2.1	Zone 7		Zone 21
4.0	Zone 4		Zone 24
4.8	Zone 22		Zone 3

Simulated specific yield, dimensionless, shown in parenthesis.

0 1 2 3 4 5
Miles

N

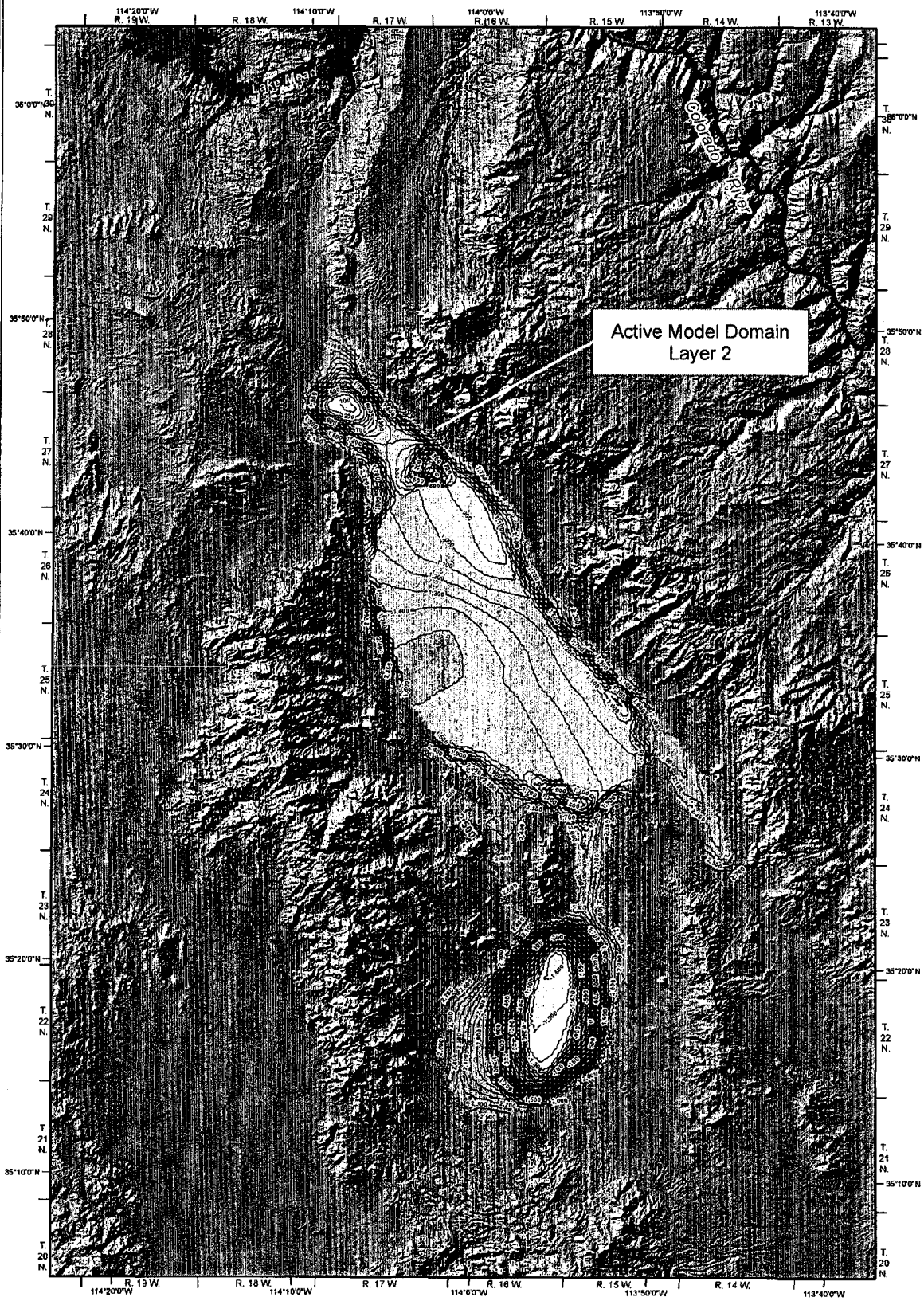
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

HYDRAULIC CONDUCTIVITY AND SPECIFIC YIELD MODEL LAYER 1

MONTGOMERY & ASSOCIATES 2009

FIGURE 10

GIS/1326.02/Figure_Layer1Kx.mxd/29July2009



EXPLANATION

Altitude of Base of Model Layer 2, in feet above mean sea level

— 1,500 — Altitude Contour, in feet msl

-1,999 - -1,500	501 - 1,000
-1,499 - -1,000	1,001 - 1,500
-999 - -500	1,501 - 2,000
-499 - 0	2,001 - 2,500
1 - 500	2,501 - 3,000

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

ALTITUDE OF BASE OF MODEL LAYER 2

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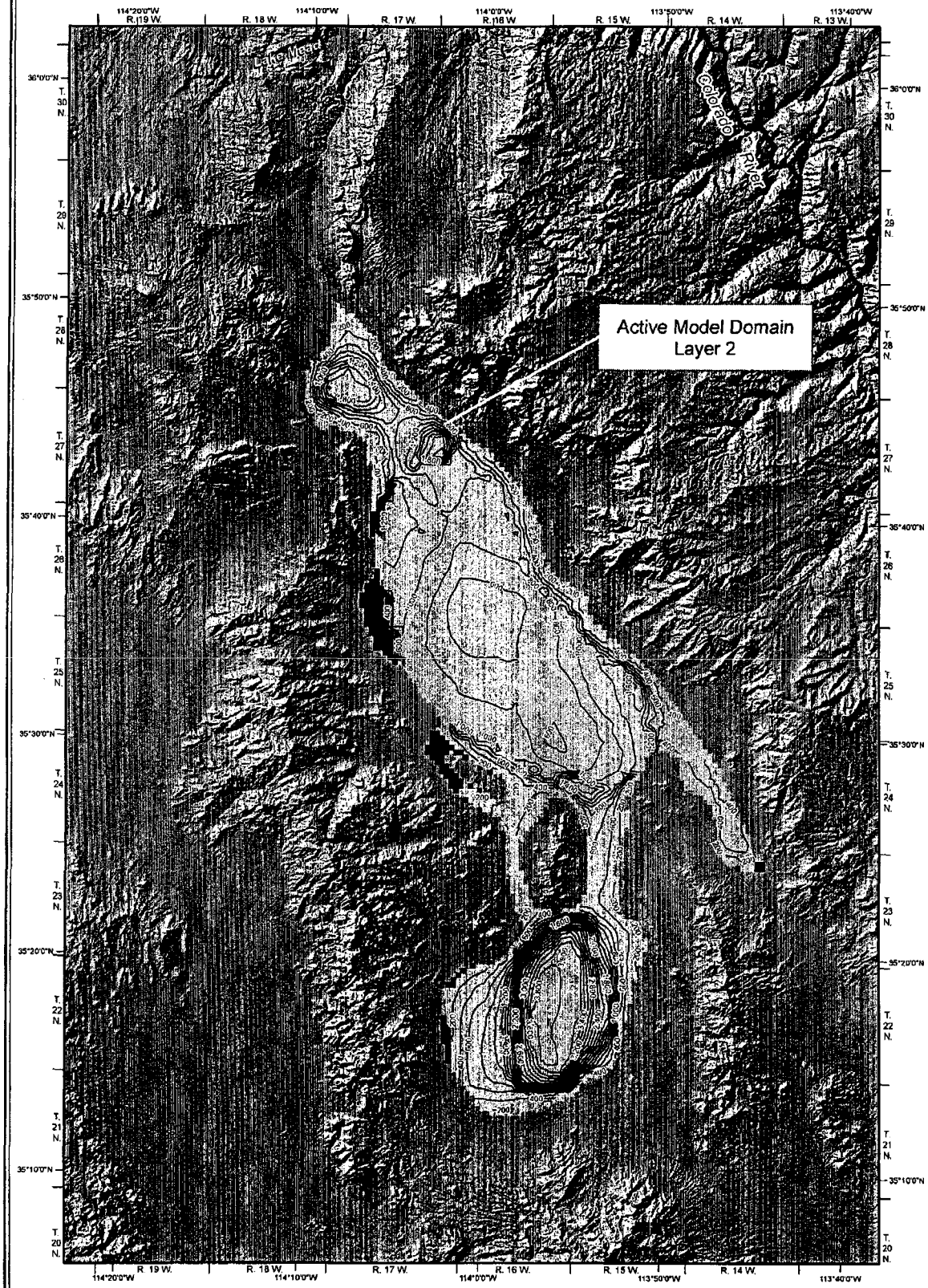
FIGURE 11

GIS/1326.02/Figure_BotLayer2.mxd/29July2009



EXPLANATION

Simulated initial saturated thickness in model layer 2, in feet.

—600— Saturated Thickness Contour, in feet

Dry Cells*

* Dry cells indicate groundwater level below the top of bedrock.

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

SIMULATED 2006 INITIAL SATURATED THICKNESS IN MODEL LAYER 2

MONTGOMERY & ASSOCIATES
Water Resources Consultants

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FIGURE 12

GIS/1326.02/Figure_SAT2_initial.mxd/29July2009

EXPLANATION

12.6 ▲ Hydraulic Conductivity reported by Montgomery & Associates, in feet per day (ft/day)

13.1 □ Hydraulic Conductivity calculated using specific capacity data, in ft/day

12.3 ● Hydraulic Conductivity reported by others, in ft/day

Note: Well identifications for hydraulic conductivity data are included in Table 1.

Simulated Horizontal Hydraulic Conductivity, in feet per day

0.50	Zone 20		Zone 22
1.0	Zone 9		Zone 8
1.0	Zone 5		Zone 21
2.0	Zone 6		Zone 24
	Zone 7		Zone 3

Simulated specific yield, dimensionless, shown in parenthesis.

0 1 2 3 4 5
Miles

N

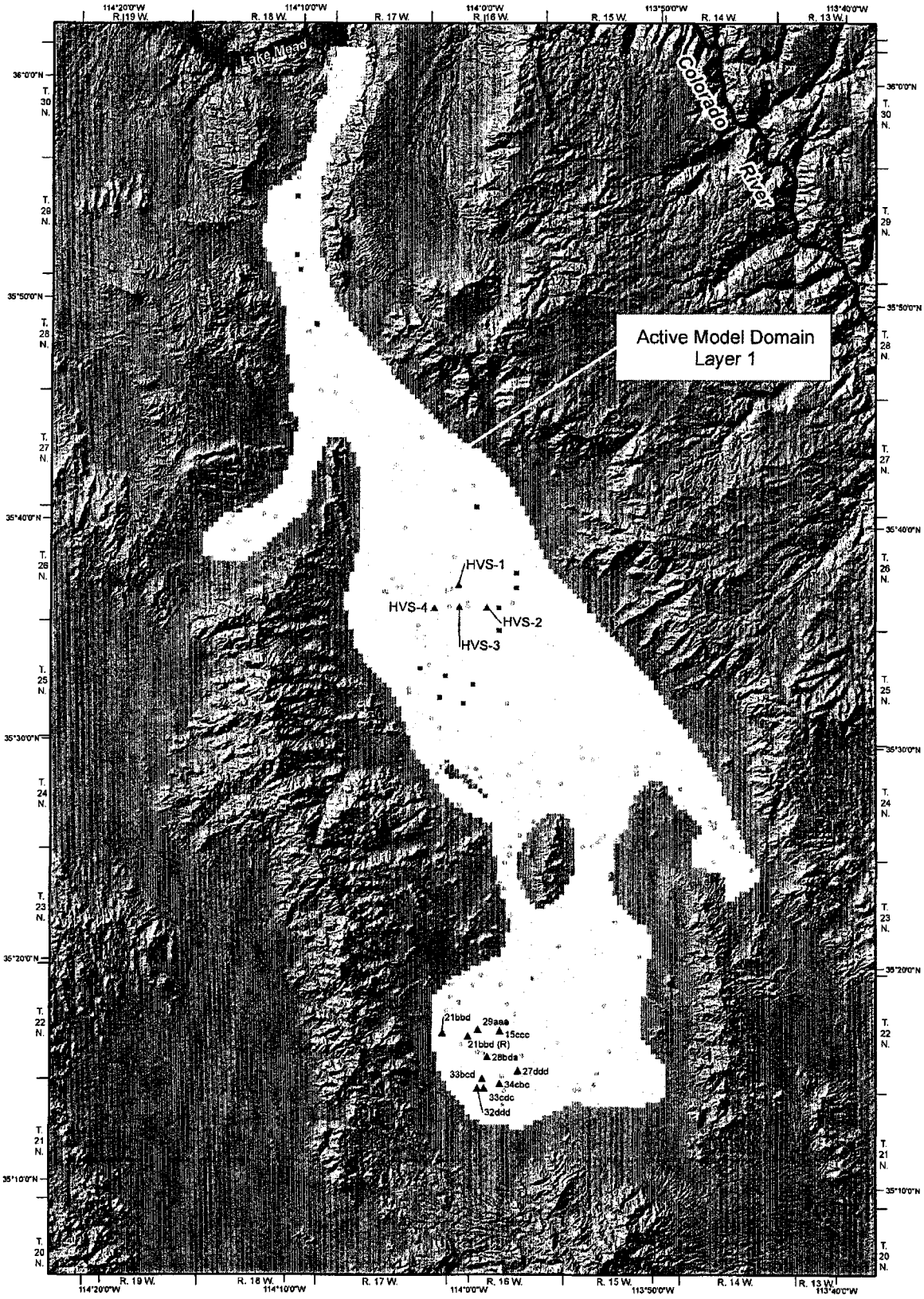
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

HYDRAULIC CONDUCTIVITY AND SPECIFIC YIELD MODEL LAYER 2

MONTGOMERY & ASSOCIATES 2009

FIGURE 13

GIS/1326.02/Figure_Layer2Kx.mxd/28July2009



EXPLANATION

Proposed pumping well and identifier

HVS-1 ▲ Proposed well for Hualapai Valley Solar

Other simulated pumping well and identifier

21bbd (R) ▲ City of Kingman (R indicates well relocated for predictive simulation)

Domestic

Other committed demand

Hualapai Valley Solar Property Boundary

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

LOCATIONS FOR
SIMULATED PUMPING WELLS

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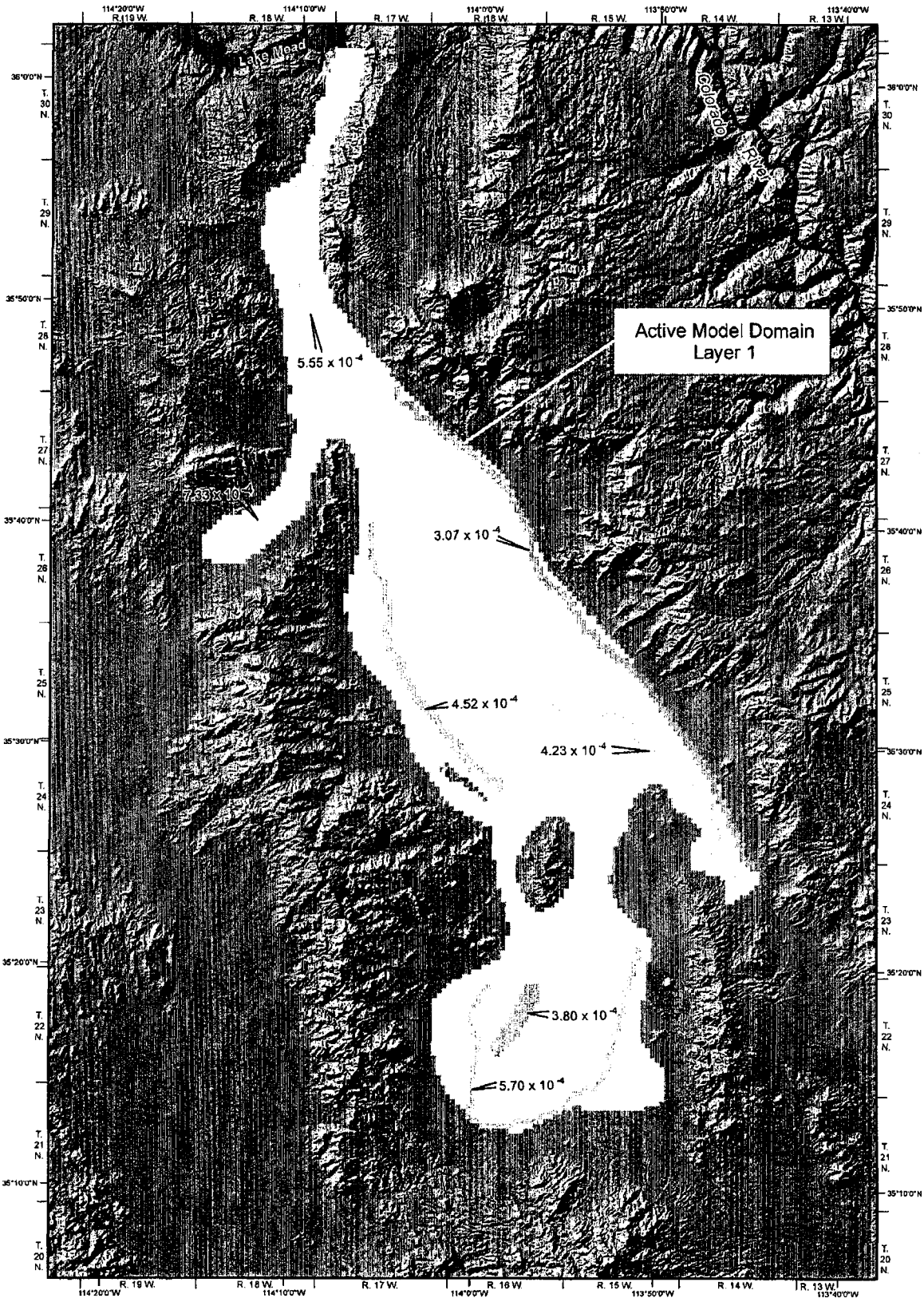
FIGURE 14

GIS/1326.02/Figure_ProjWells_HVS.mxd/29Jul2009



EXPLANATION

Simulated Mountain Front Recharge, in feet per day

- 3.07×10^{-4} (775 AF/yr)
- 4.52×10^{-4} (575 AF/yr)
- 5.70×10^{-4} (700 AF/yr)

Simulated Stream Channel Recharge, in feet per day

- 3.80×10^{-4} (300 AF/yr)
- 4.23×10^{-4} (550 AF/yr)
- 5.55×10^{-4} (600 AF/yr)
- 7.33×10^{-4} (300 AF/yr)

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

MAP OF SIMULATED RECHARGE DISTRIBUTION

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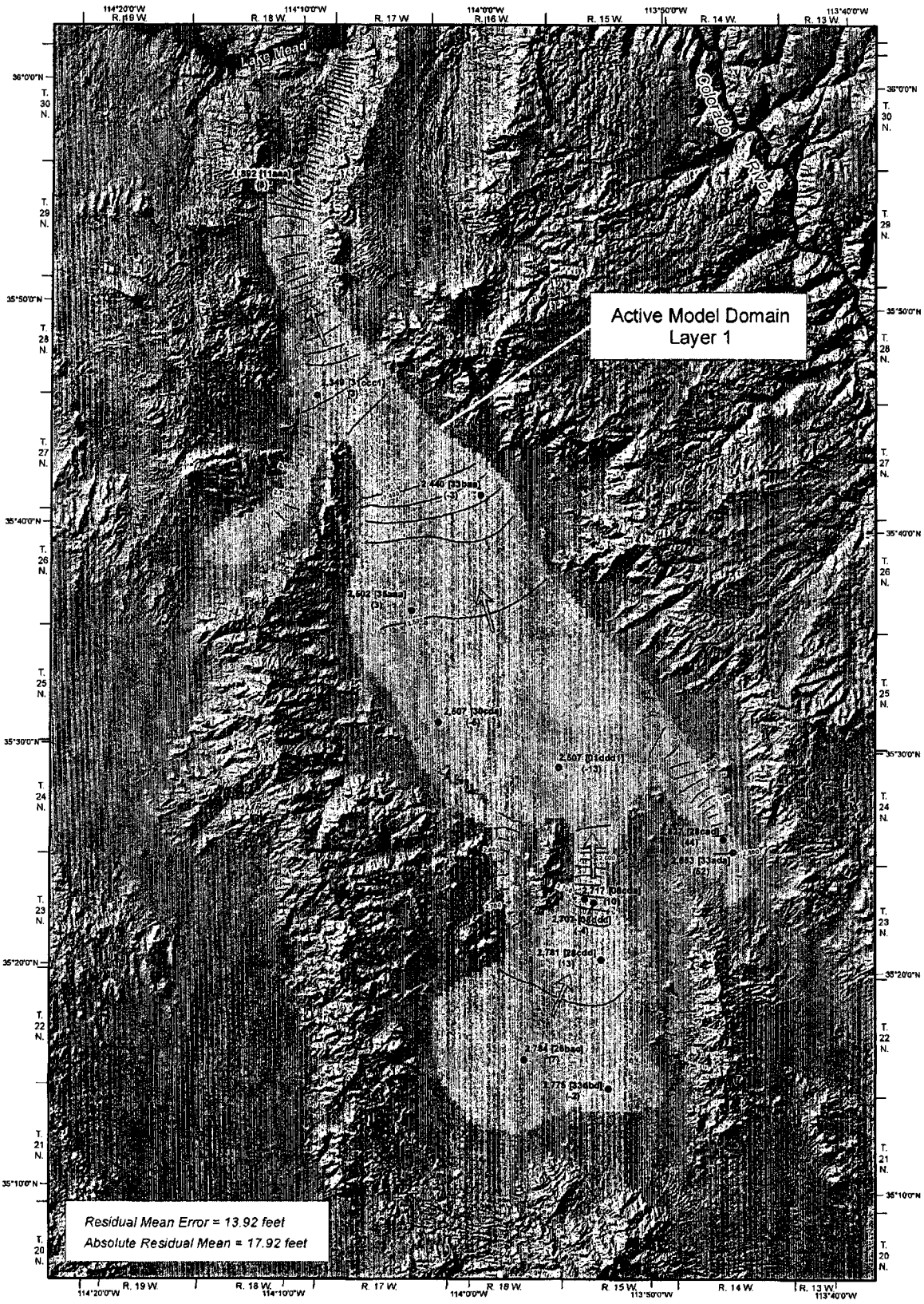
Water Resource Consultants

2009

FIGURE 15

GIS/1326.02Figure_Recharge.mxd/29July2009



EXPLANATION

2,600 — Altitude Contour of Simulated Groundwater Level, in feet above mean sea level (ft msl)

2,775 [33dbd] ● Observed Groundwater Level Altitude 1965 - 1970, in feet msl

(-2) — Cadastral Section Location in parenthesis

Observed minus Simulated Groundwater Level Altitude, in feet msl (negative indicates simulated is higher than observed)

Principal Groundwater Flow Direction

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

SIMULATED AND OBSERVED GROUNDWATER LEVEL ALTITUDES PRE - 1970

MONTGOMERY & ASSOCIATES 2009

FIGURE 16

GIS/1326.02/Figure_1970Calib.mxd/29July2009

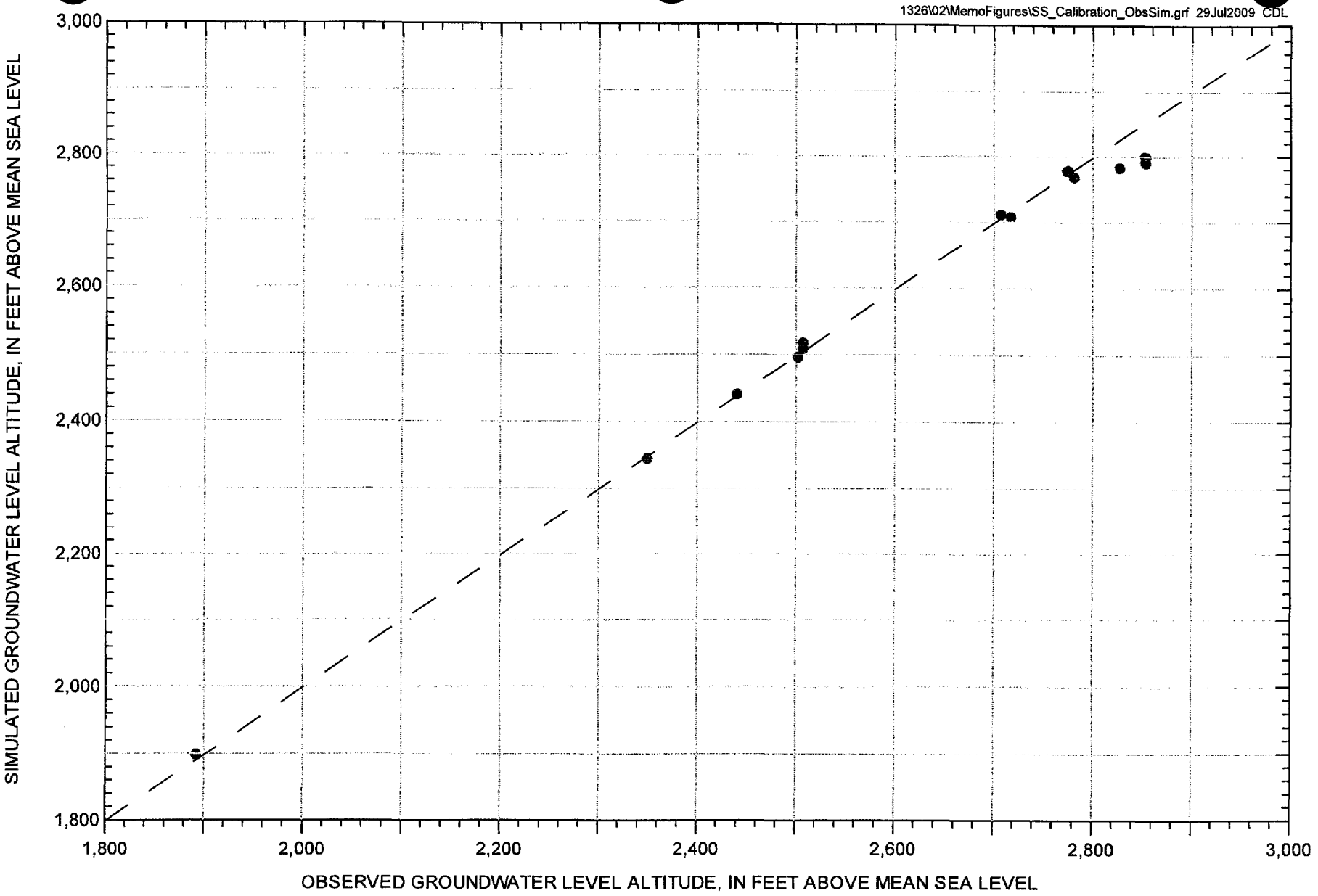


FIGURE 17. GRAPH OF OBSERVED AND SIMULATED GROUNDWATER LEVEL ALTITUDES FOR 1970 STEADY-STATE CALIBRATION

MONTGOMERY & ASSOCIATES

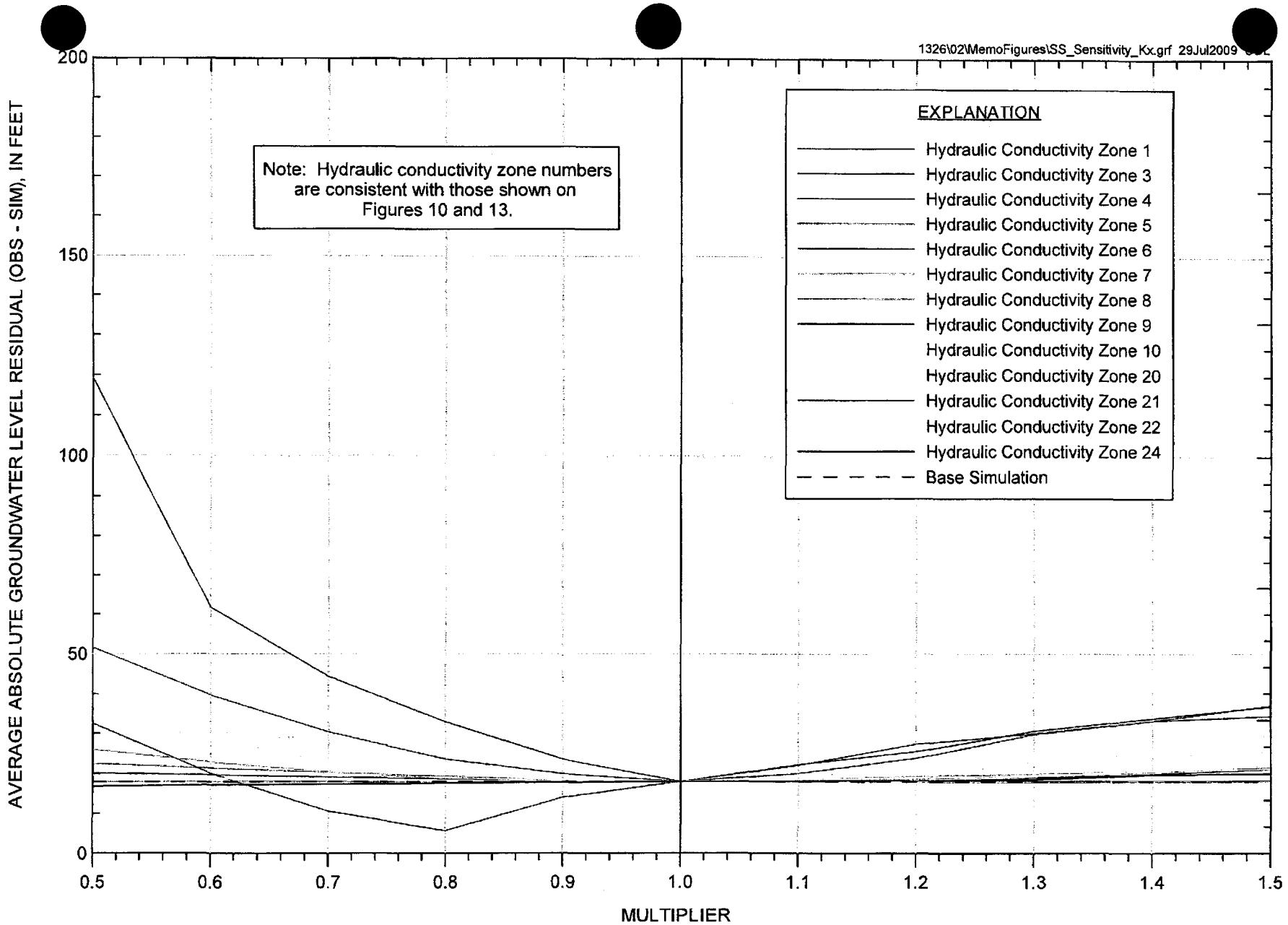


FIGURE 18. SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED - SIMULATED) DUE TO VARYING HORIZONTAL HYDRAULIC CONDUCTIVITY, STEADY-STATE SIMULATION

MONTGOMERY & ASSOCIATES

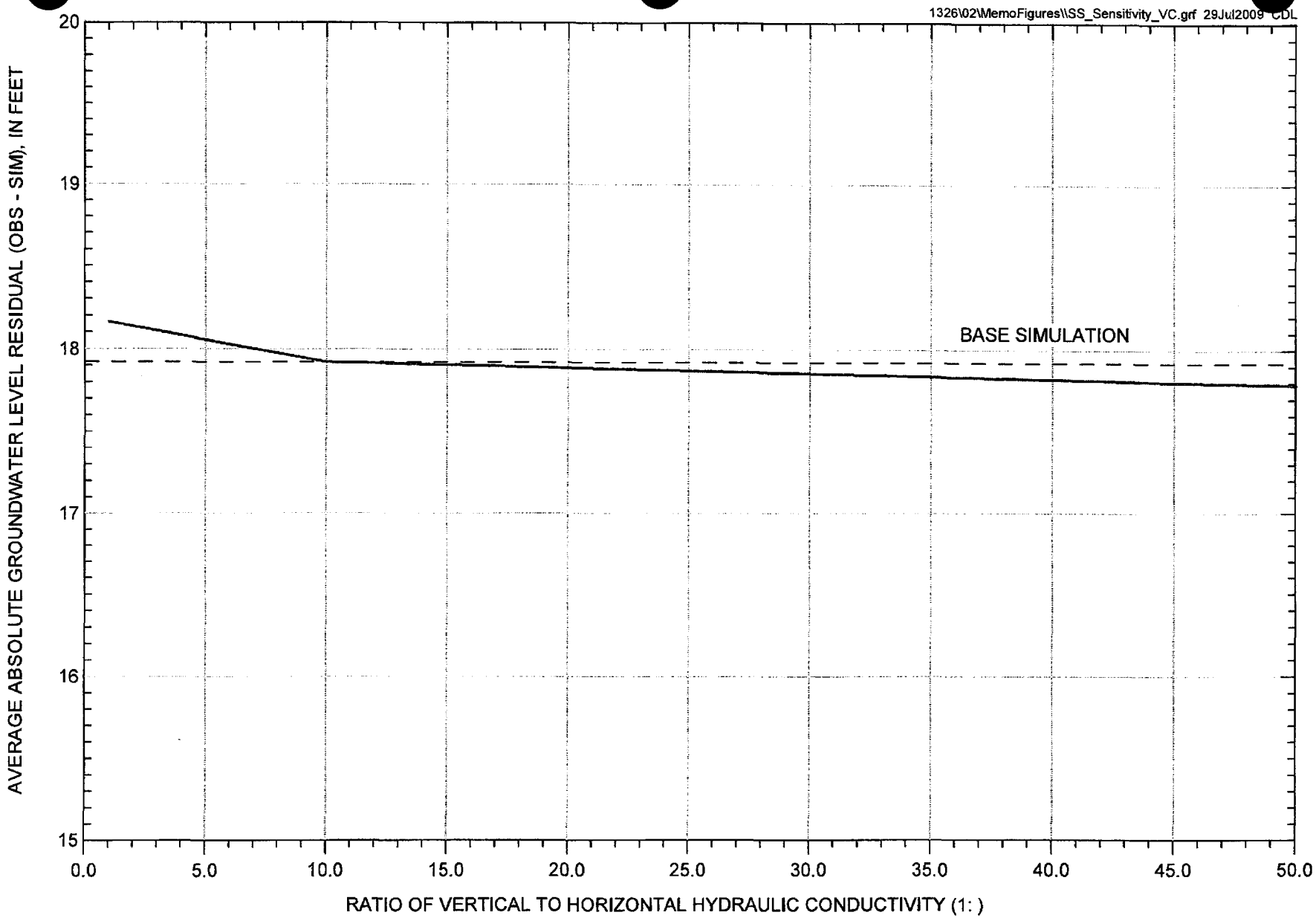


FIGURE 19. SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED - SIMULATED) DUE TO VARYING RATIO OF VERTICAL TO HORIZONTAL HYDRAULIC CONDUCTIVITY, STEADY-STATE SIMULATION

MONTGOMERY & ASSOCIATES

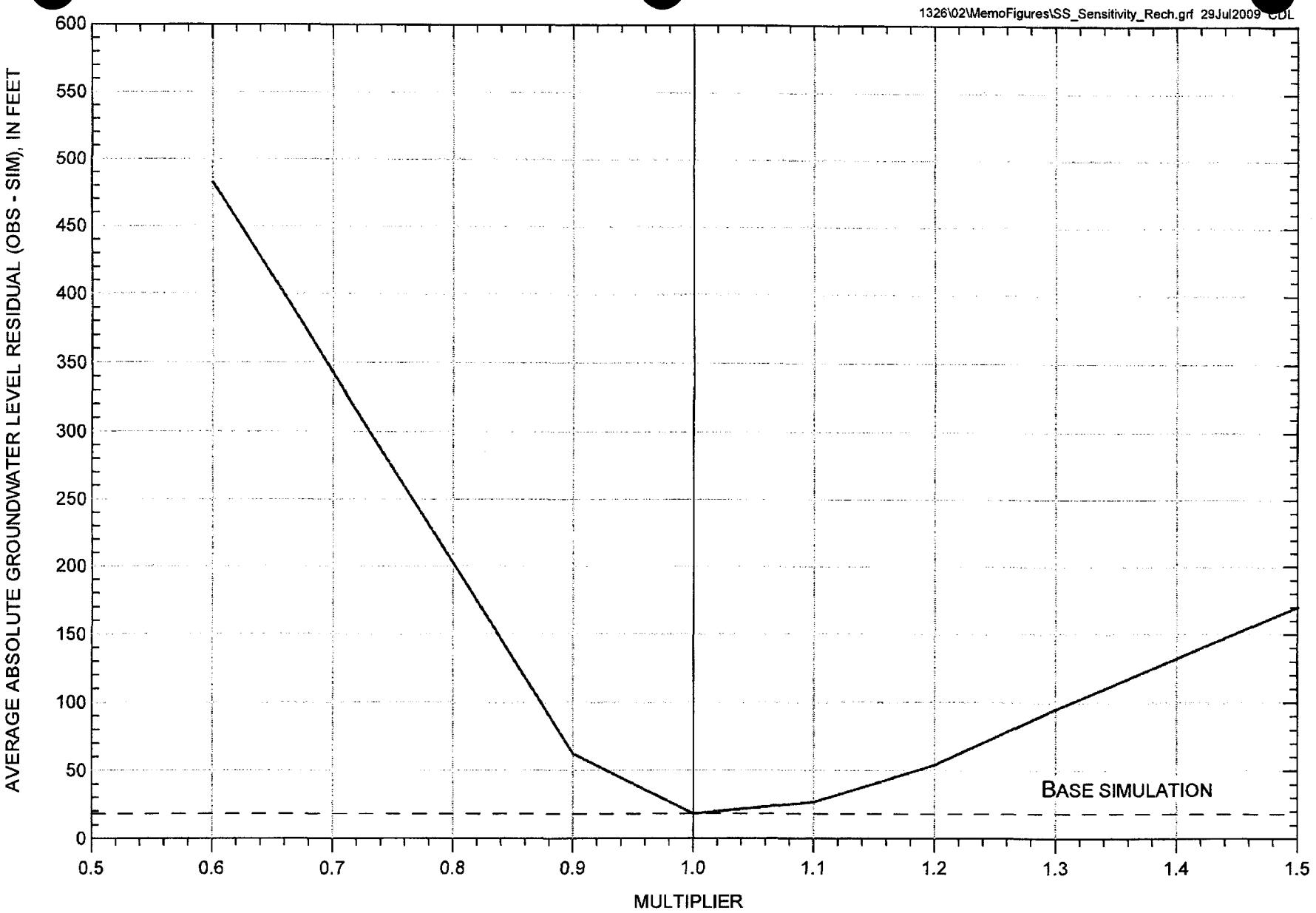
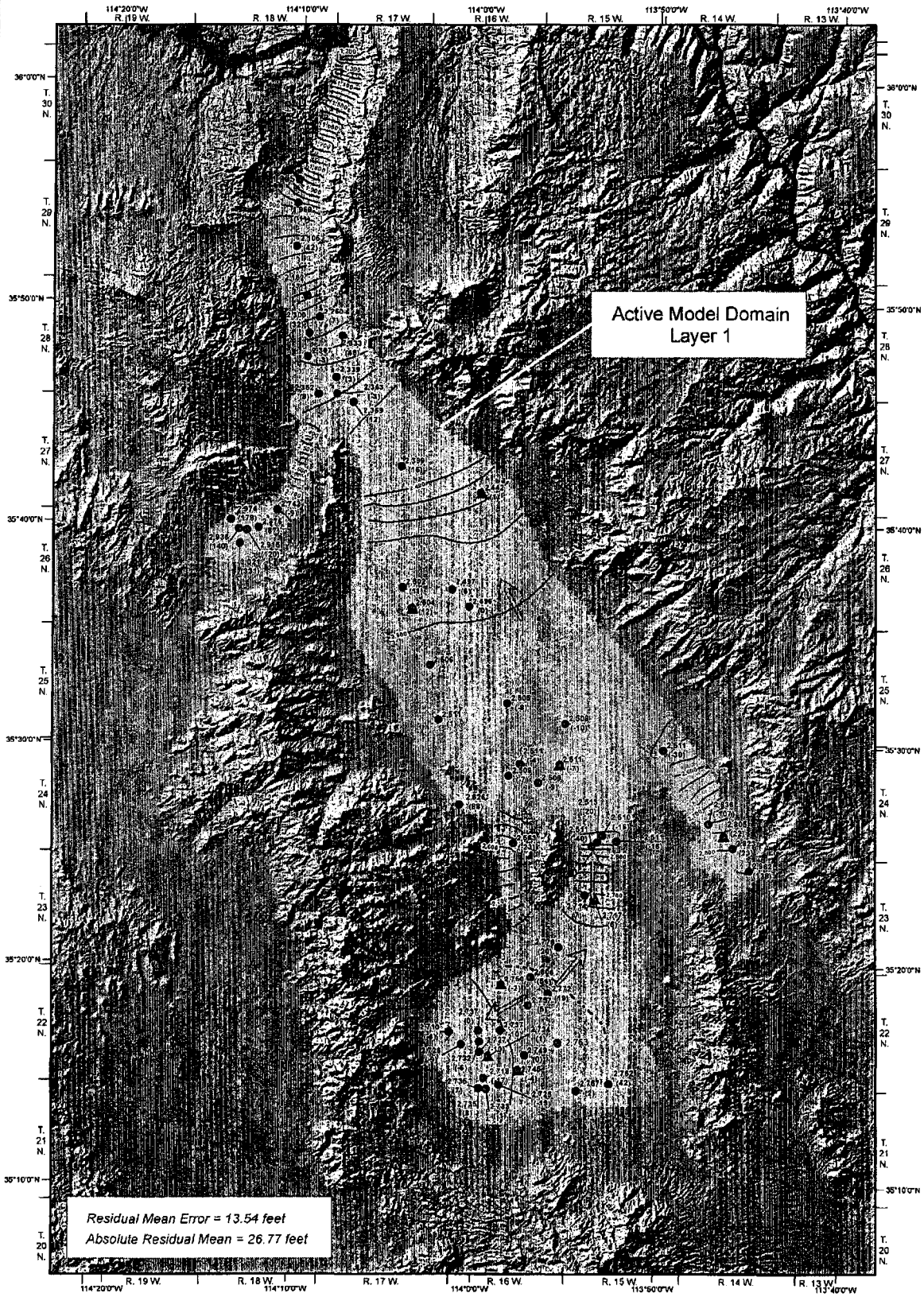


FIGURE 20. SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED - SIMULATED) DUE TO VARYING TOTAL RECHARGE, STEADY-STATE SIMULATION

MONTGOMERY & ASSOCIATES



EXPLANATION

- 2,500 — Altitude Contour of Simulated Groundwater Level, in feet above mean sea level
- 2,505 (-8) ● — Observed Groundwater Level Altitude, October 2005 - February 2006, in feet msl; Observed minus Simulated Groundwater Level Altitude, in ft msl
- 1,905 ● — Observed Groundwater Level Altitude which was not included in the numerical calibration, October 2005 - February 2006, in feet msl
- ▲ — Transient Conditions Hydrograph Location
- Principal Groundwater Flow Direction
- Approximate Location of Groundwater Divide

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

SIMULATED AND OBSERVED GROUNDWATER LEVEL ALTITUDES OCT. 2005 THROUGH FEB. 2006

MONTGOMERY & ASSOCIATES
Water Resource Consultants
2009
FIGURE 21

GIS/1326.02/Figure_2005Calib.mxd/25July2009

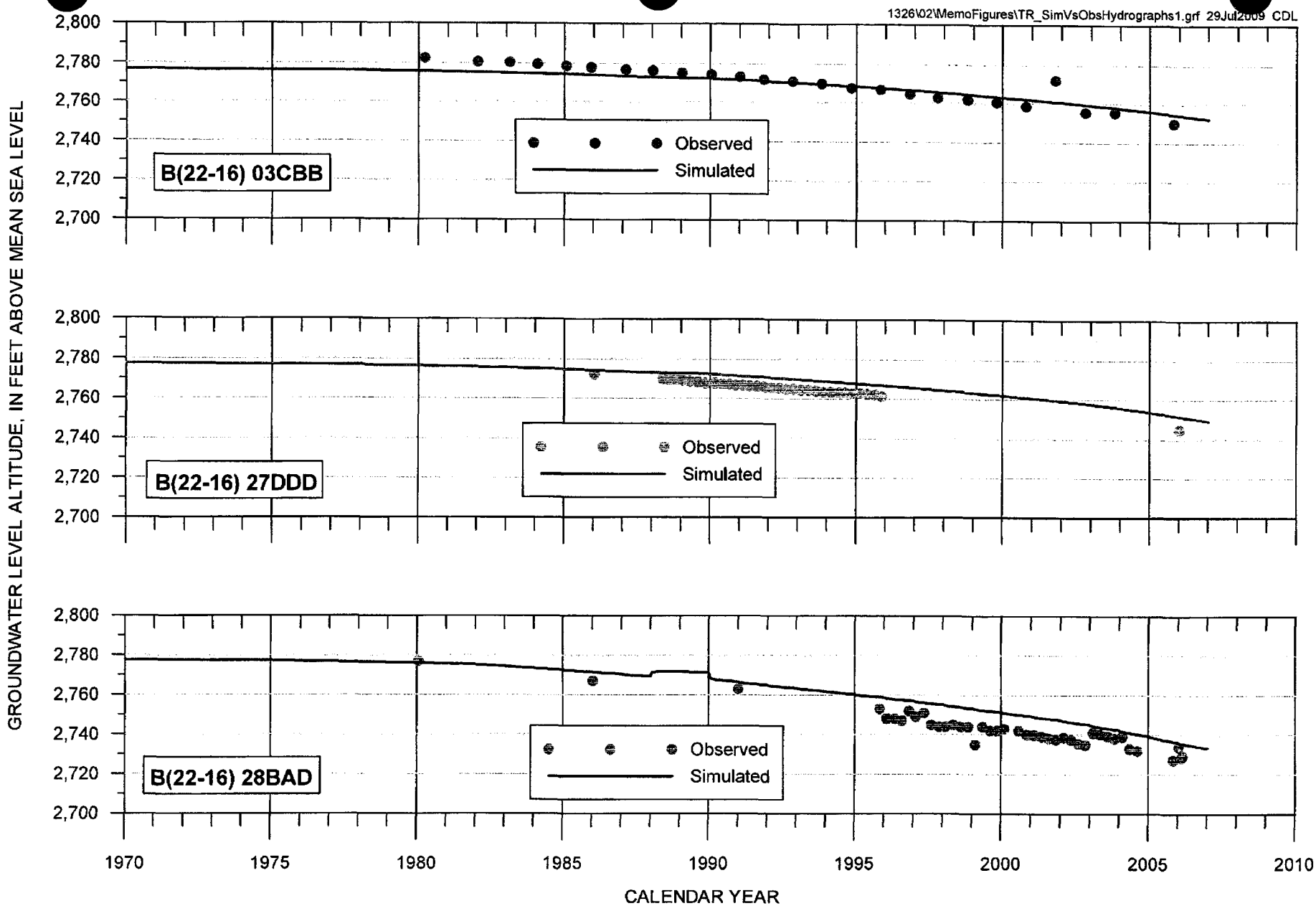


FIGURE 22a. OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT IN KINGMAN SUB-BASIN

MONTGOMERY & ASSOCIATES

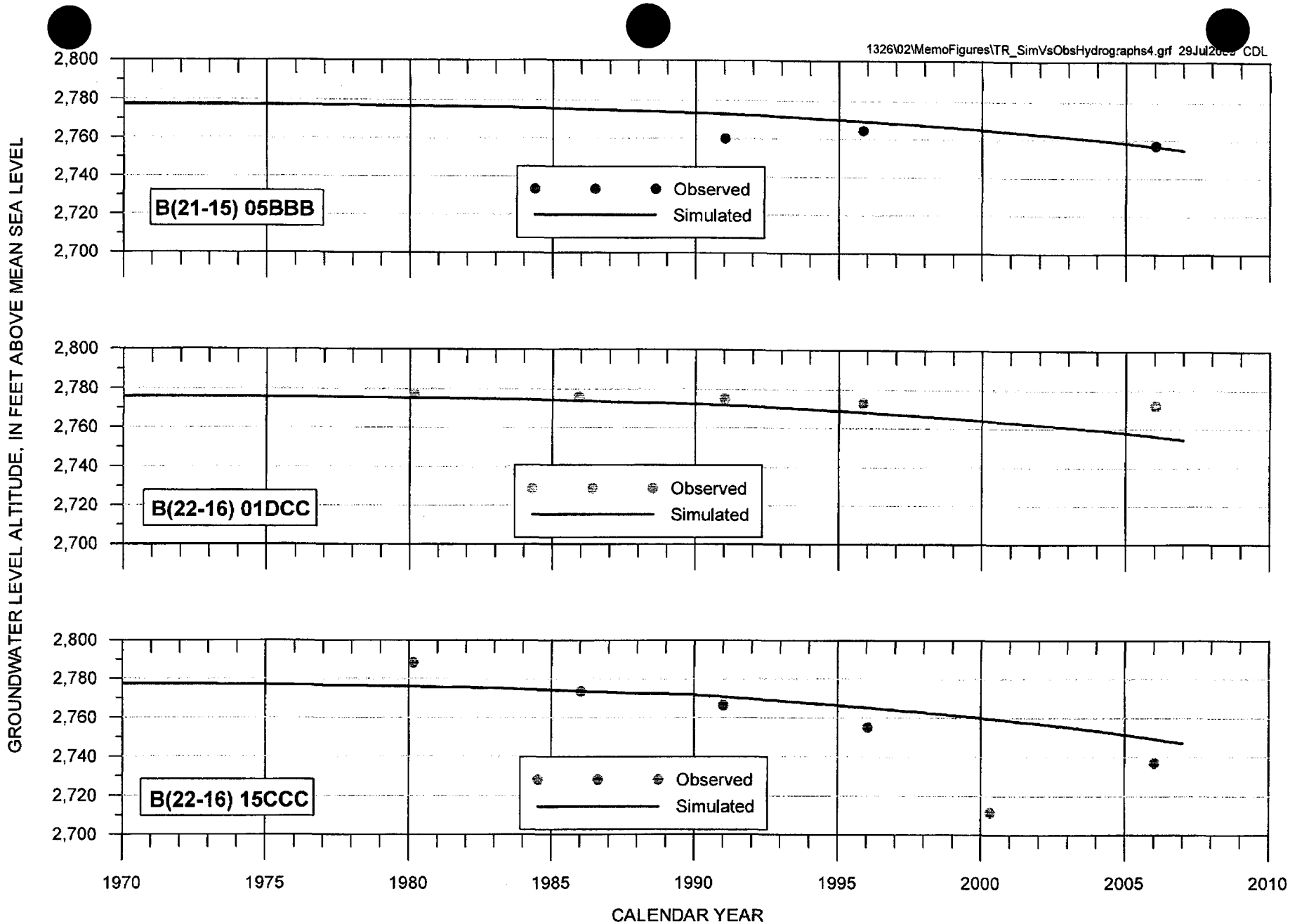


FIGURE 22b. OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT IN KINGMAN SUB-BASIN

MONTGOMERY & ASSOCIATES

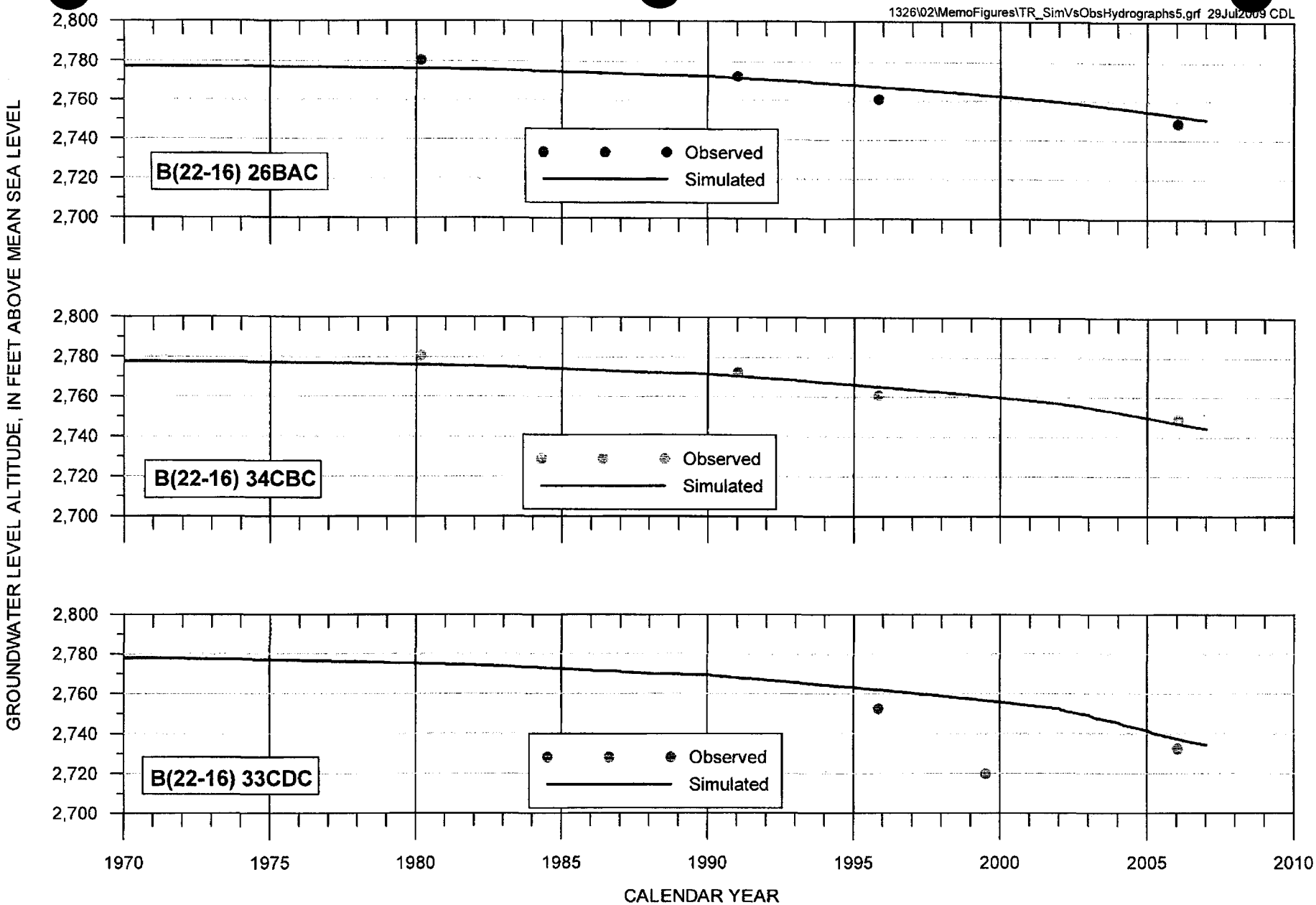


FIGURE 22c. OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT IN KINGMAN SUB-BASIN

MONTGOMERY & ASSOCIATES

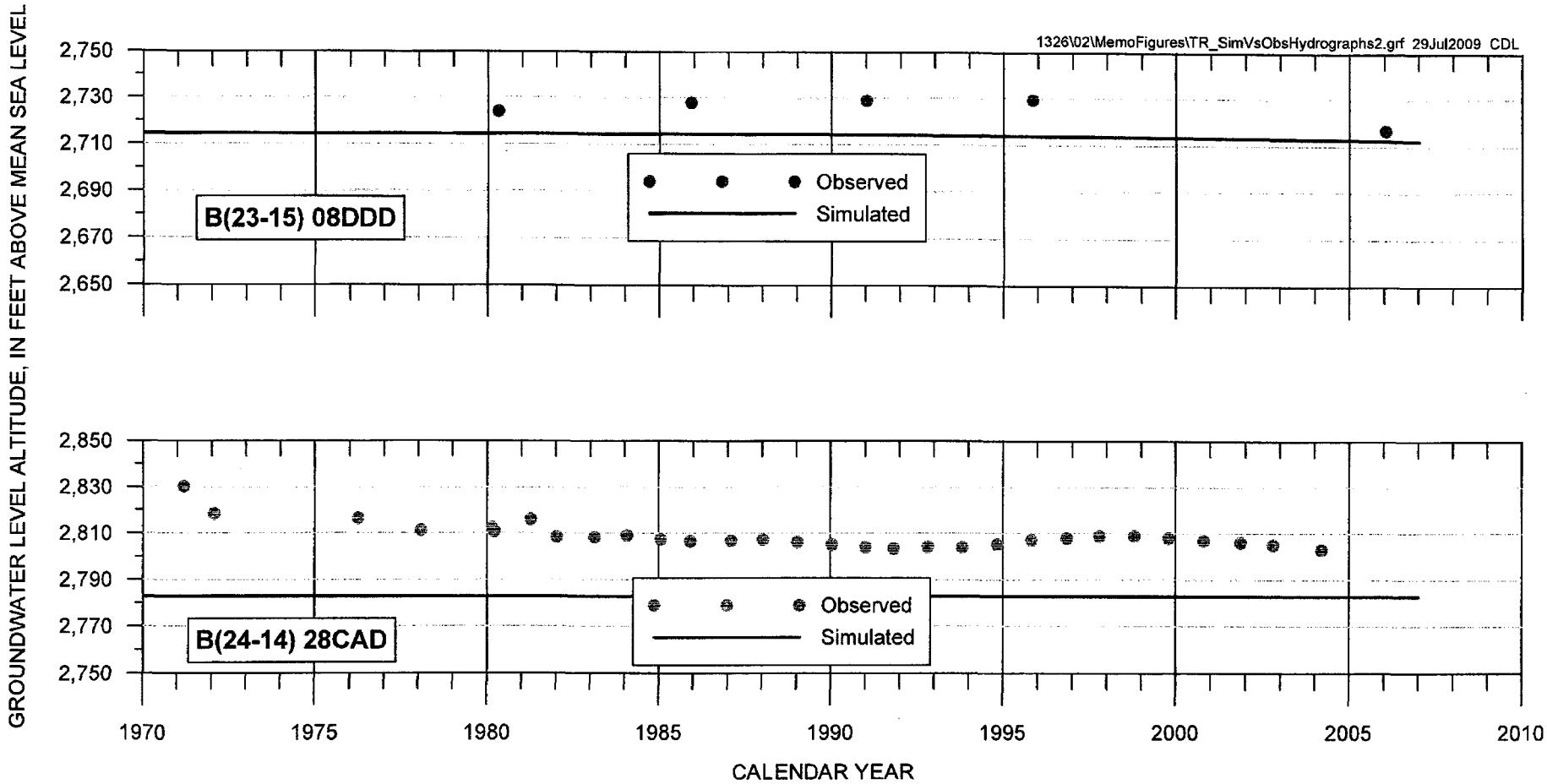


FIGURE 22d. OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT NEAR LONG MOUNTAIN

MONTGOMERY & ASSOCIATES

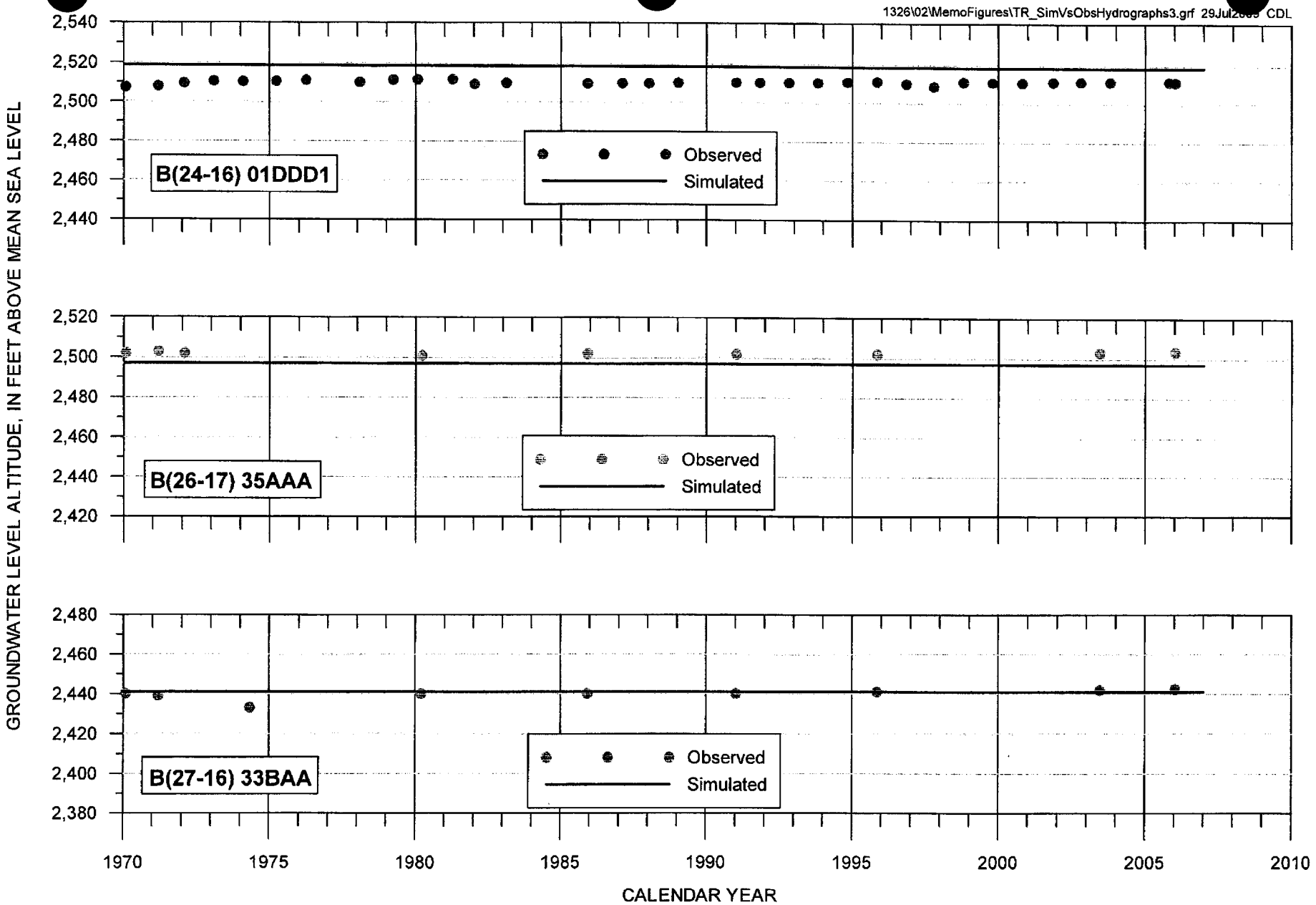


FIGURE 22e. OBSERVED AND SIMULATED GROUNDWATER LEVEL HYDROGRAPHS FROM 1970 TO PRESENT NEAR RED LAKE AREA

MONTGOMERY & ASSOCIATES

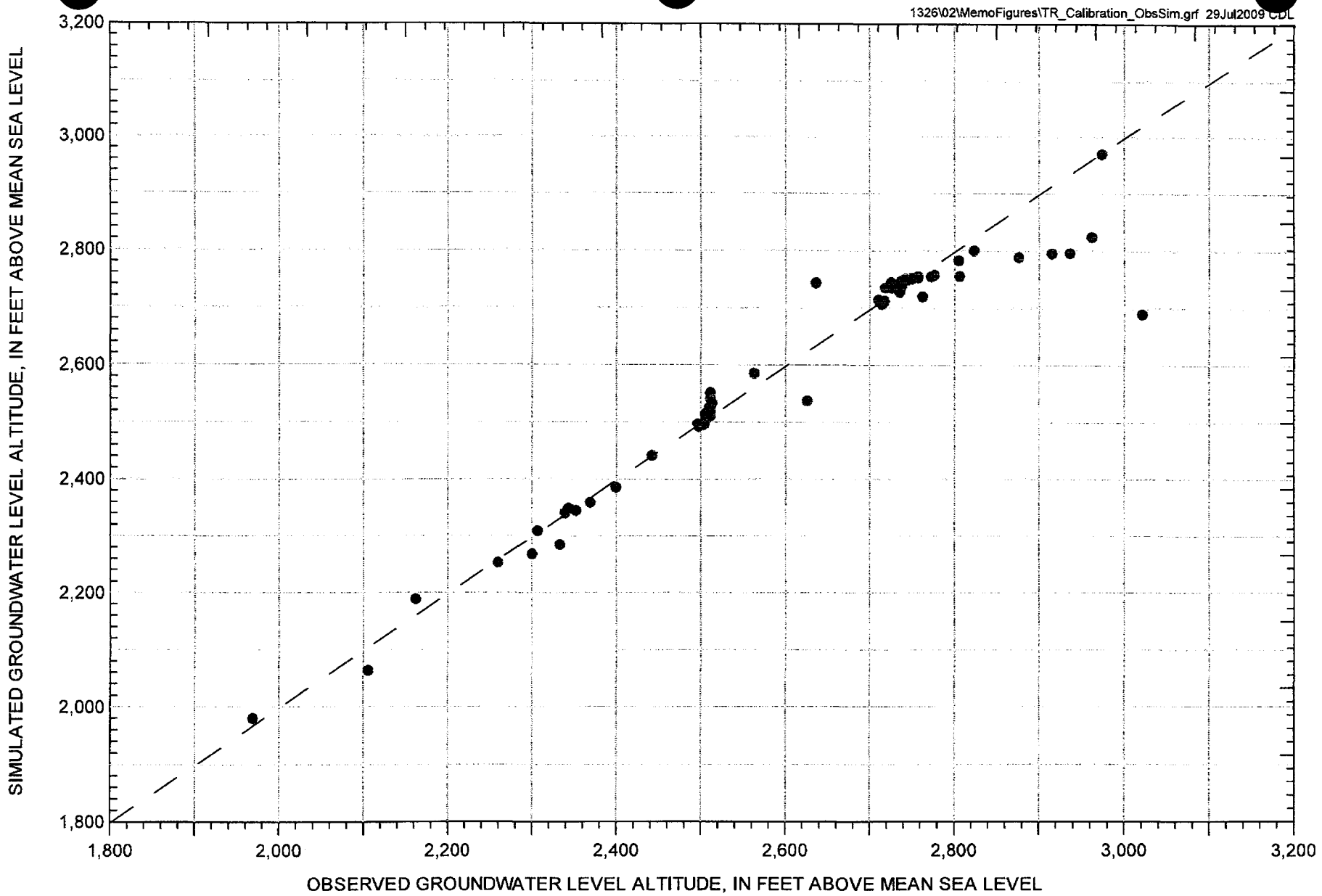


FIGURE 23. GRAPH OF OBSERVED AND SIMULATED GROUNDWATER LEVEL ALTITUDES FOR OCTOBER 2005 THROUGH FEBRUARY 2006, TRANSIENT CALIBRATION

MONTGOMERY & ASSOCIATES

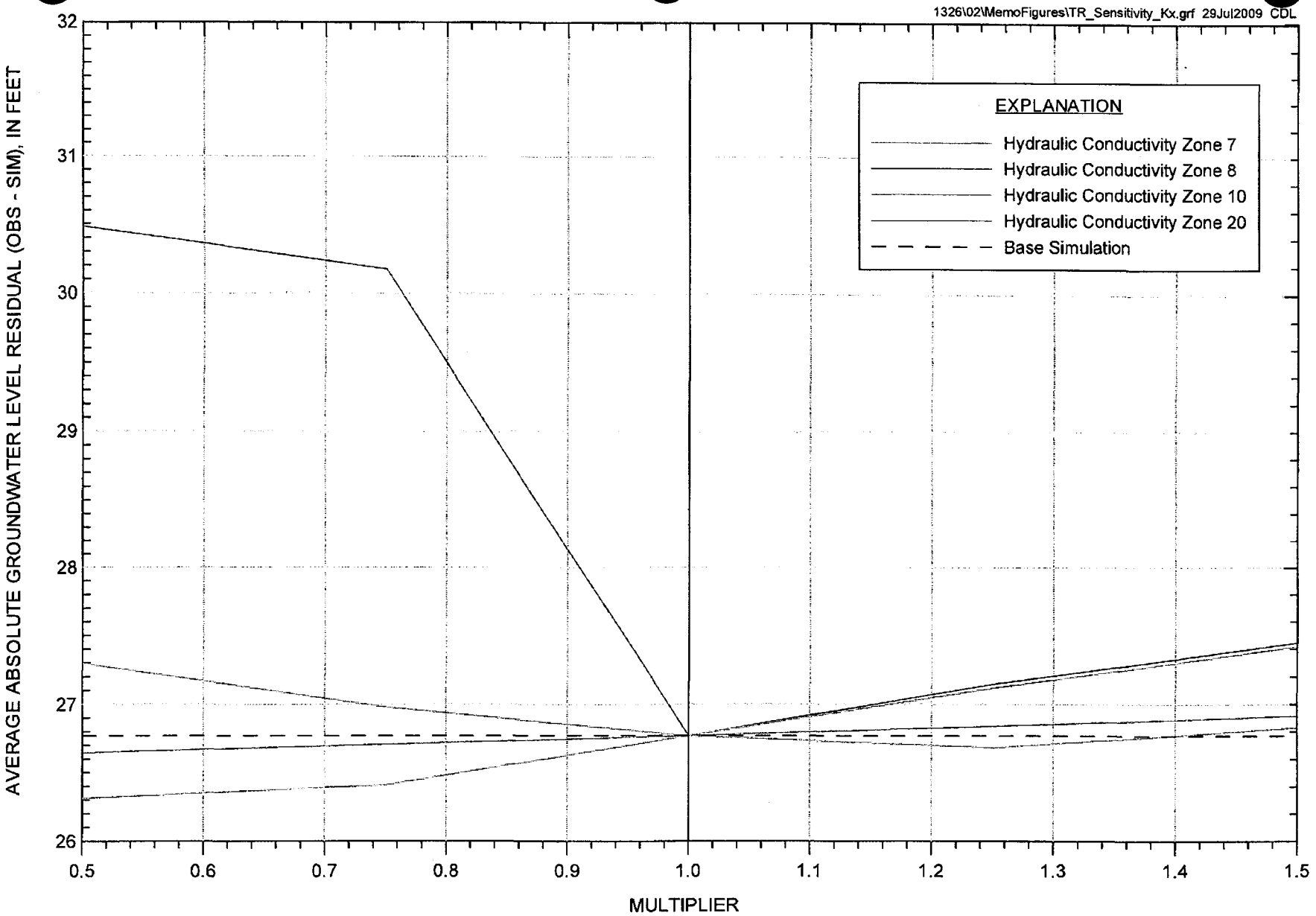


FIGURE 24. SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED - SIMULATED) DUE TO VARYING HORIZONTAL HYDRAULIC CONDUCTIVITY, TRANSIENT SIMULATION

MONTGOMERY & ASSOCIATES

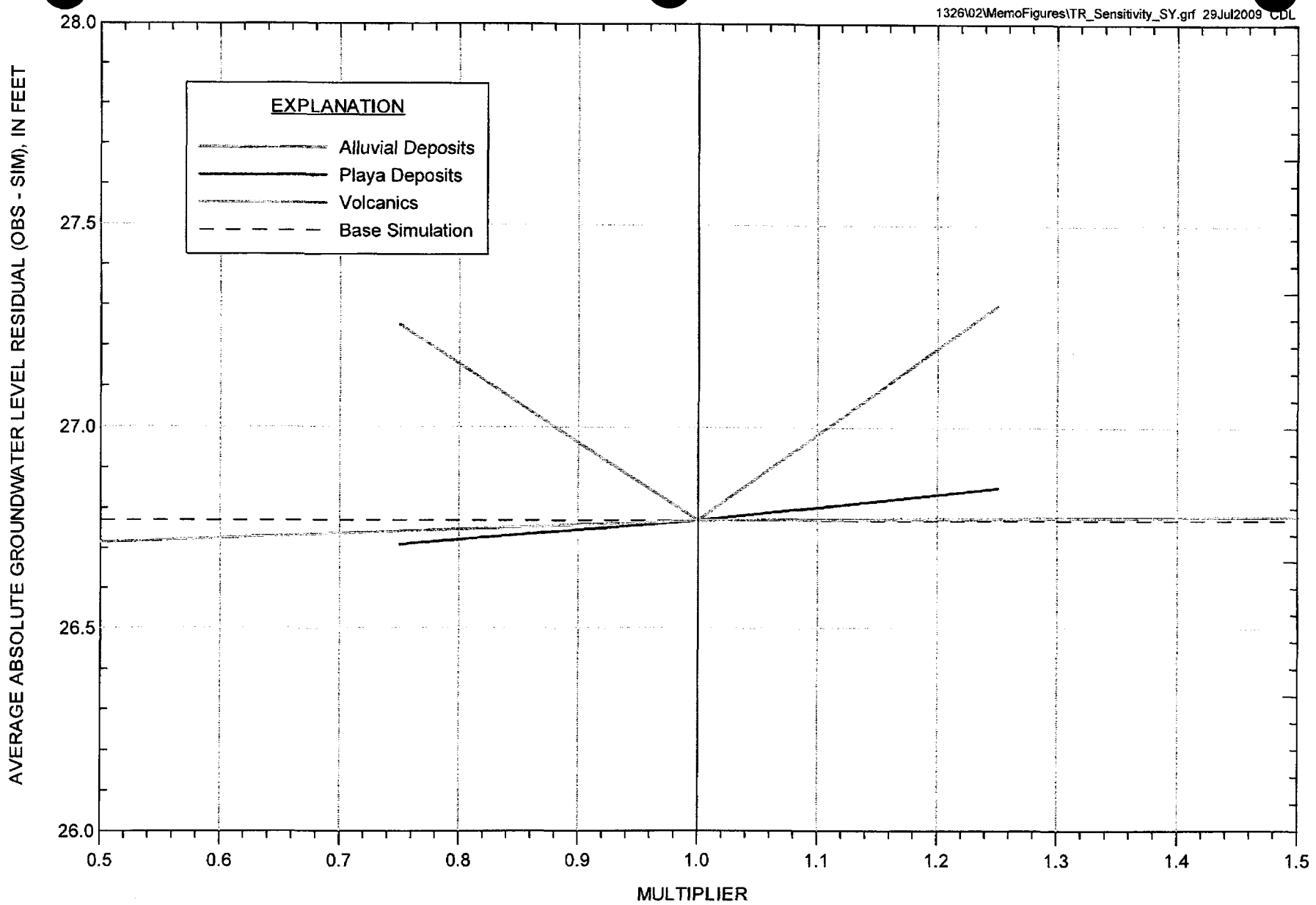


FIGURE 25. SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED - SIMULATED) DUE TO VARYING SPECIFIC YIELD, TRANSIENT SIMULATION

MONTGOMERY & ASSOCIATES

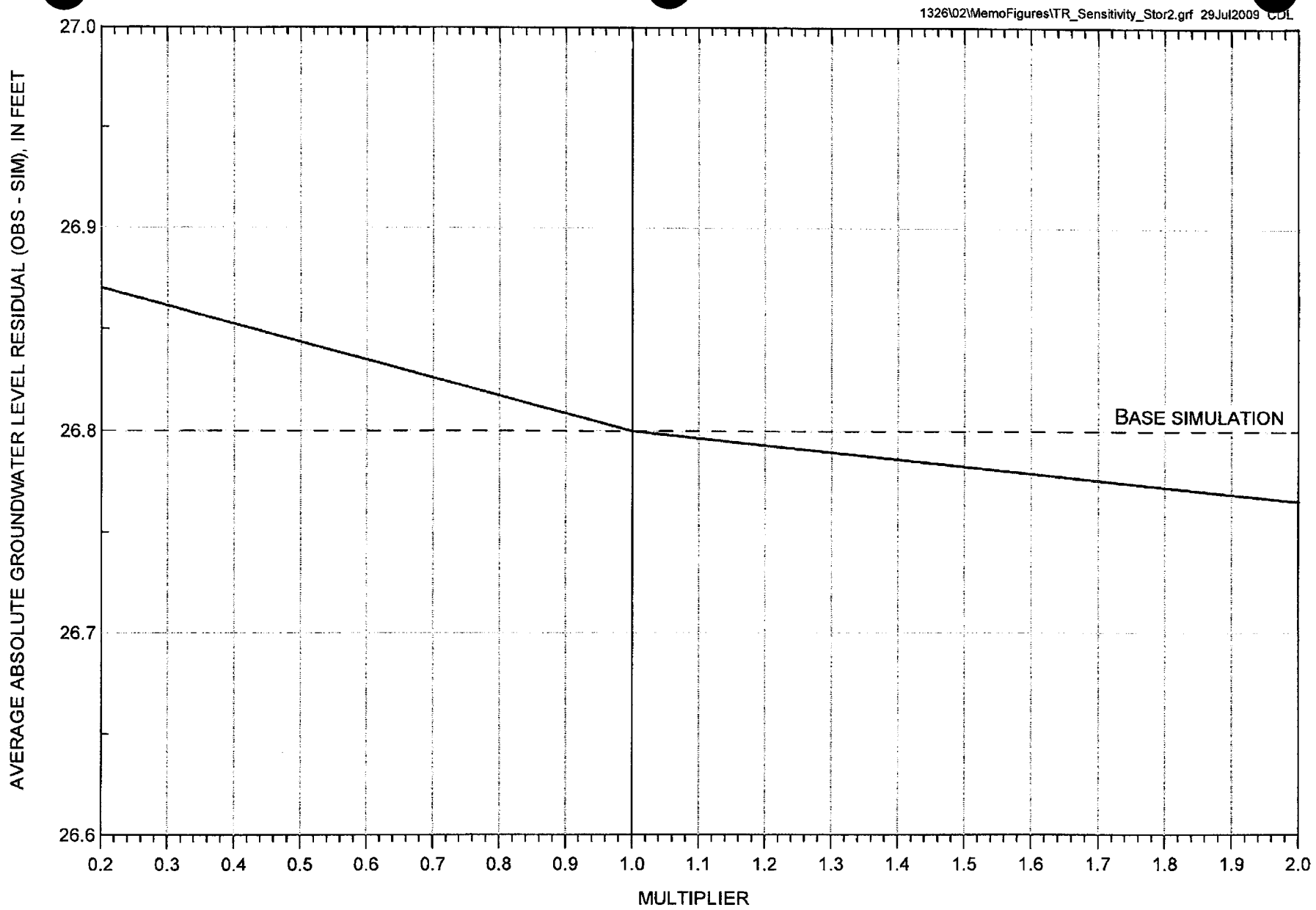
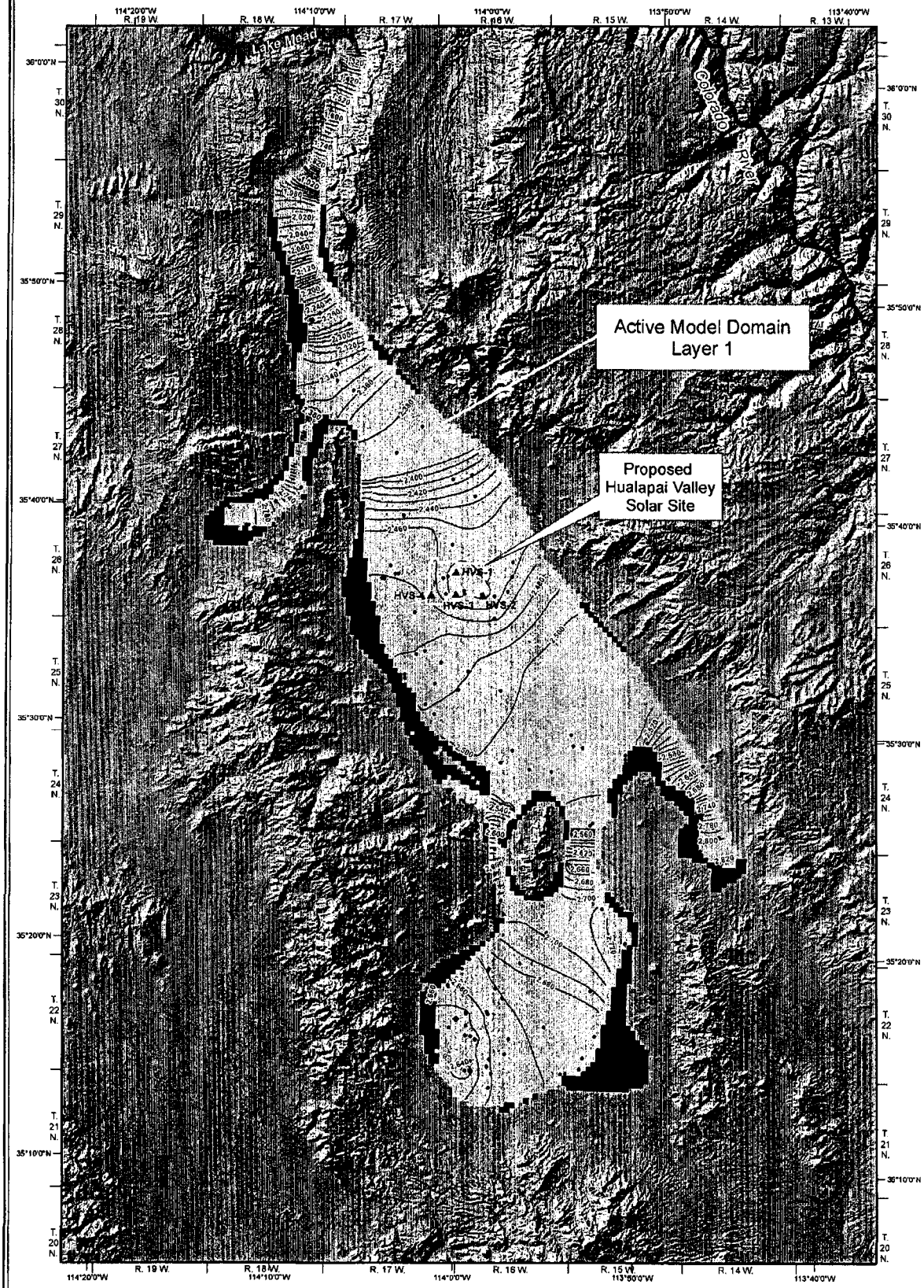


FIGURE 26. SENSITIVITY OF AVERAGE ABSOLUTE GROUNDWATER LEVEL RESIDUAL (OBSERVED - SIMULATED) DUE TO VARYING STORAGE COEFFICIENT, TRANSIENT SIMULATION

MONTGOMERY & ASSOCIATES



EXPLANATION

Projected groundwater level altitude, in feet above mean sea level, after 30 years of pumping at the Hualapai Valley Solar Plant

HVS-1 ▲ Proposed Location of Hualapai Valley Solar Plant Well, and Identifier

• Other Wells Simulated in Groundwater Model

—2,500— Groundwater Level Altitude Contour, in feet msl

Dry Cells*

* Dry cells indicate groundwater level is below top of simulated bedrock

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

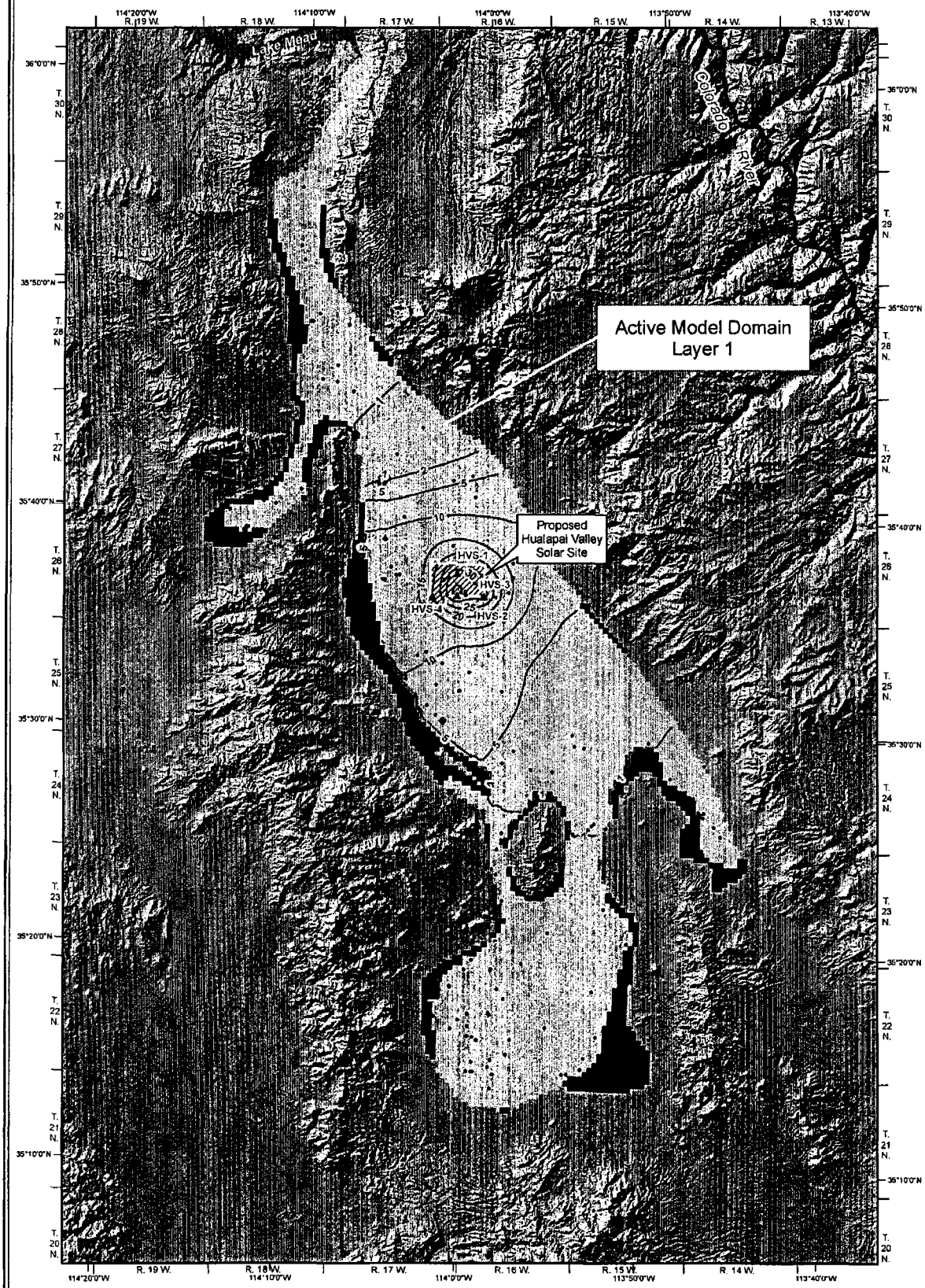
PROJECTED GROUNDWATER LEVEL ALTITUDE AT END OF 2042

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2009

FIGURE 27

GIS/1326/02/Figure_WL_30yrs.mxd/29Jul09



EXPLANATION

Projected groundwater level decline, in feet due to Hualapai Valley Solar Plant after 30 years of pumping

HVS-1 ▲ Proposed Location of Hualapai Valley Solar Plant Well, and Identifier

• Other Wells Simulated in Groundwater Model

5 Groundwater Level Decline Contour, in feet (maximum decline = 38 feet)

Dry Cells*

* Dry cells indicate groundwater level is belowtop of simulated bedrock

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL DECLINE AT END OF 2042

MONTGOMERY & ASSOCIATES
Water Resources Consultants
2009
FIGURE 28

GIS-Tuc\Figure_WL_dd_30yrs\29July2009

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APPENDIX A

WELL NUMBERING SYSTEM

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APPENDIX A

WELL NUMBERING SYSTEM

The well numbers used in this report are in accordance with the Bureau of Land Management's system of land subdivision. The land survey in Arizona is based on the Gila and Salt River meridian and base line, which divide the state into four quadrants. These quadrants are designated, counter-clockwise, by the capital letters A, B, C, and D. All land north and east of the point of origin is in quadrant A; all land north and west of the origin is in quadrant B; all land south and west of the origin is in quadrant C; and all land south and east of the origin is in quadrant D. The first digit of a well number indicates the township, the second digit the range, and the third digit the section in which the well is located. The lowercase letters a, b, c, and d after the section number indicate the well location within the section. The first letter denotes a particular 160-acre tract or quarter section; the second letter denotes the 40-acre trace or quarter-quarter section; and the third letter denotes the 10-acre tract or quarter-quarter-quarter section. These letters are also assigned in a counter-clockwise direction, beginning in the northeast quarter. As shown on **Figure A-1**, well number (B-05-03)15aaa designates the well as being located in the Northeast ¼, Northeast ¼, Northeast ¼ of Section 15, Township 5 North, Range 3 West. Where more than one well is located within a 10-acre tract, consecutive numbers beginning with "1" may be added as suffixes.

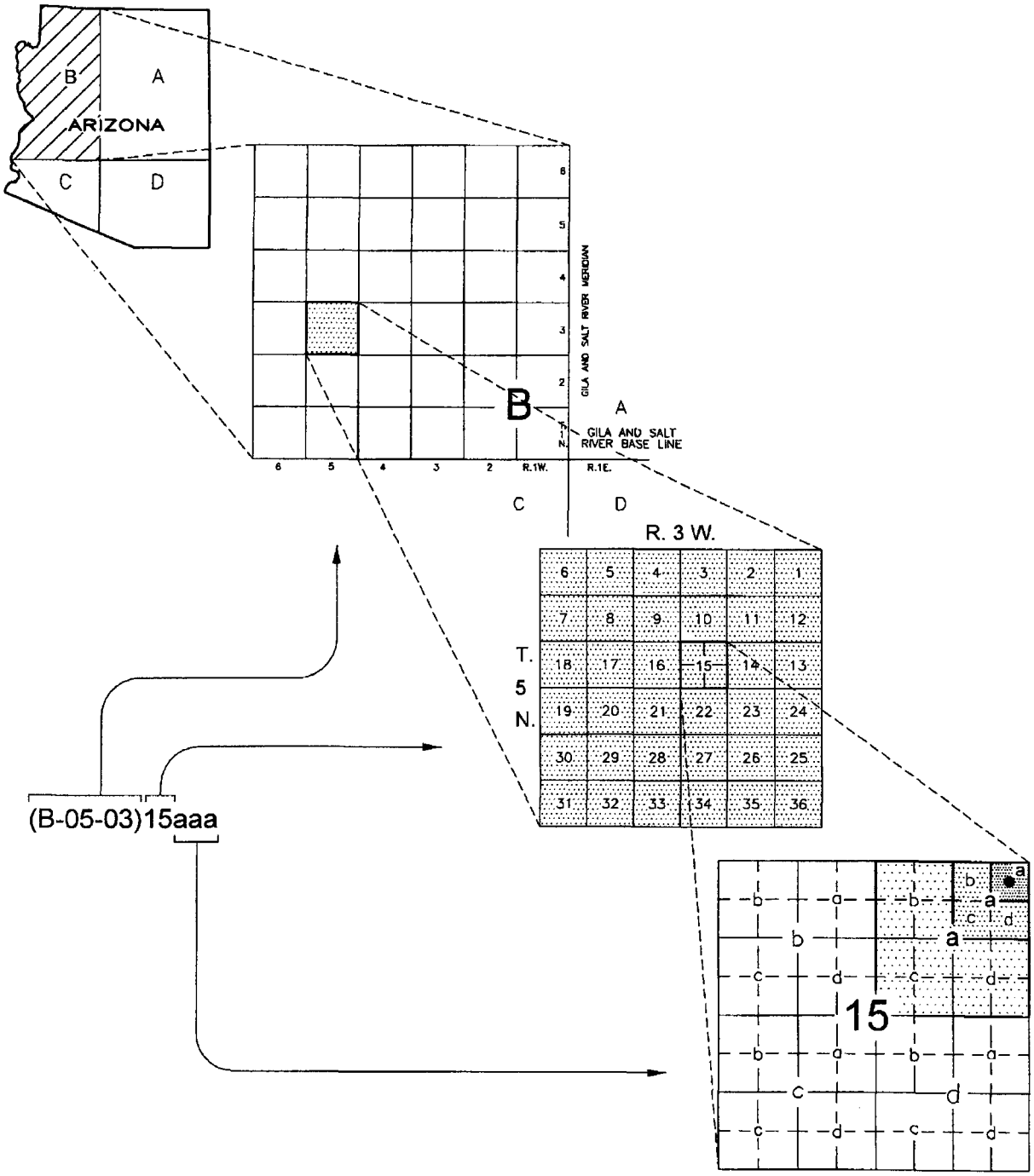

FIGURE A-1. WELL NUMBERING DIAGRAM

440\well numbering diagram\18Mar2005

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& ASSOCIATES

APPENDIX B

WELL INVENTORY
(FROM M&A, 2007)

MONTGOMERY
& ASSOCIATES

APPENDIX B

Table

B-1 WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA (MODIFIED FROM M&A, 2007)

Shading:

- Water well on or adjacent to Hualapai Valley Solar (HVS) site
- Non-water well on or adjacent to HVS site
- Water well within 1.5 miles of HVS site
- Selected wells with water quality data more than 1.5 miles from HVS site

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(20-15) 01AB	Wells55	642322	—	—	—	243,457	3,893,177	—	94	—	—	—	—	—	80.0	—	PROD / S	—	—	—	BLM-PHOENIX DISTRICT,
B(21-14) 08BBA	Wells55	201220	—	—	—	244,009	3,902,916	—	360	- 380	6	—	—	—	253.0	—	PROD / D	D	—	—	THOMPSON, KEVANN
B(21-14) 19CCC	Wells55	531730	—	—	—	243,632	3,896,669	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	FARR, RALPH & ELLEN,
B(21-14) 19CCD	Wells55	543333	—	—	—	243,833	3,896,684	4/27/1994	702	- 20	6	—	—	—	—	—	NONE	D	—	—	TRANSWESTERN PIPELIN,
B(21-14) 29BBC	GWSI	631002	—	351042113474801	—	245,314	3,896,204	4/1/1980	595	—	—	—	4,260	4/1/1980	—	—	U	—	—	—	BINGO GAS CO.
B(21-14) 31CCC	Wells55	631002	—	—	—	243,543	3,893,474	4/30/1980	—	—	—	—	—	—	—	—	X	—	—	—	TRUE VALUE OIL,
B(21-14) 29CCC	GWSI	—	—	351003113475601	—	245,078	3,895,008	—	354	0 -	6	—	4,340	7/15/1969	—	—	U	—	—	—	—
B(21-14) 29CCC	Wells35	—	13549	—	—	245,193	3,895,037	—	354	—	6	—	—	—	—	—	X / K	P	—	—	—
B(21-14) 30ACC	Wells55	564883	—	—	—	244,412	3,895,863	—	855	- 855	7	—	—	—	737.0	—	PROD / D	D	—	—	BROWN, JACQUELYN
B(21-14) 30CAA	Wells55	533607	—	—	—	244,206	3,895,667	2/12/1992	860	- 860	8	—	—	—	720.0	—	PROD / D	D	80	95	BLAKE CATTLE CO,
B(21-14) 30DAA	Wells55	203573	—	—	—	245,008	3,895,647	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ABBOTT, LON K
B(21-14) 31AAB	Wells55	565647	—	—	—	244,785	3,894,847	1/24/1998	920	- 920	5	—	—	—	826.0	—	PROD / D	D	5	20	BIANCO, VINCENT AND JUD
B(21-14) 31ADB	Wells55	202492	—	—	—	244,774	3,894,445	—	780	- 780	6	—	—	—	591.0	—	PROD / D	D	—	—	PROA, FRANK & CHARLEN
B(21-14) 31BBC	Wells55	205105	—	—	—	243,576	3,894,677	9/23/2004	205	- 205	6	—	—	—	205.0	—	PROD / D	D	—	—	HENGRICKS, MICHAEL
B(21-14) 31BBD	Wells55	507411	—	—	—	243,776	3,894,672	3/16/1984	270	- 270	8	—	—	—	70.0	—	PROD / D	D	—	—	ADAMS & ASKEW,
B(21-14) 31BCD	Wells55	594136	—	—	—	243,766	3,894,271	10/15/2002	193	- 193	5	—	—	—	53.0	—	PROD / D	D	15	15	ENGLERT, DOUGLAS C
B(21-14) 31CBA	Wells55	208298	—	—	—	243,760	3,894,070	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	KELLY-FULTZ, PATRICIA I
B(21-14) 31CCA	Wells35	—	13550	—	—	243,750	3,893,659	—	450	—	—	—	—	—	350.0	—	PROD / A	P	—	4	—
B(21-14) 31CCC1	GWSI	641874	—	350911113485501	—	243,540	3,893,448	1/1/1951	350	0 -	6	—	4,590	1/7/1991	182.0	4,408.0	U	—	—	—	BLAKE CATTLE CO
B(21-14) 31CCC	Wells55	641874	—	—	—	243,543	3,893,474	1/1/1947	400	- 400	6	—	—	—	300.0	—	PROD / S	—	20	20	BLAKE CATTLE CO,
B(21-14) 31CCC	Wells55	507412	—	—	—	243,543	3,893,474	3/13/1984	500	- 500	8	—	—	—	400.0	—	PROD / D	D	—	—	ADAMS & ASKEW,
B(21-14) 31CCC	Wells55	516706	—	—	—	243,543	3,893,474	1/29/1987	575	- 20	8	—	—	—	—	—	PROD / D	D	—	—	WARD, JACK,
B(21-14) 31CCC	Wells55	630153	—	—	—	243,543	3,893,474	4/30/1980	575	—	—	—	—	—	—	—	—	—	—	—	TRUE VALUE OIL,
B(21-14) 31CCC	Wells35	—	13551	—	—	243,543	3,893,474	1/1/1980	575	—	—	—	—	—	151.0	—	X / K	D	—	—	—
B(21-14) 31CCC	Wells35	—	13554	—	35-84453	243,543	3,893,474	4/30/1980	575	—	—	—	—	—	—	—	PROD / D	—	—	—	TRUE VALUE OIL CO
B(21-14) 31CCC	Wells35	—	13552	—	—	243,543	3,893,474	—	250	—	6	—	—	—	153.0	—	X / K	P	—	—	—
B(21-14) 31CCC	Wells35	—	13553	—	—	243,543	3,893,474	—	480	—	6	—	—	—	—	—	PROD / A	P	—	4	—
B(21-14) 31CCC2	GWSI	—	—	350910113485601	—	243,513	3,893,418	—	250	0 -	6	—	4,590	7/15/1969	153.0	4,437.0	U	—	—	—	BLAKE CATTLE CO
B(21-14) 31CCC3	GWSI	—	—	350910113485501	—	243,539	3,893,417	—	300	0 -	8	—	4,585	5/21/1980	52.0	4,533.0	PROD / C	—	20	20	BLAKE CATTLE CO
B(21-14) 32BBA	Wells55	067547	—	—	—	245,388	3,894,830	1/1/1981	490	—	—	—	—	—	—	—	PROD / S	—	—	—	BLAKE CATTLE CO,
B(21-15) 05ADC	Wells55	207831	—	—	—	236,955	3,902,518	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	FIGUEROA, AGUEDA & PAULIN
B(21-15) 05BBB	M&A	526379	—	—	—	235,691	3,903,212	—	—	—	9	—	—	10/25/2005	875.0	—	—	—	—	—	—
B(21-15) 05BBB	GWSI	526379	—	351420113541601	—	235,693	3,903,211	1/12/1990	1,320	0 - 25	10	25 - 930	3,630	1/10/2006	872.8	2,757.2	U	D	—	—	JEWELL DEVELOPMENT
B(21-15) 05BBB	GWSI	526379	—	351420113541601	—	235,693	3,903,211	2/14/1990	1,320	0 - 25	10	930 - 1,320	3,630	1/10/2006	872.8	2,757.2	U	D	—	—	JEWELL DEVELOPMENT
B(21-15) 05BBB	Wells55	526379	—	—	—	235,762	3,903,155	2/14/1990	1,320	- 1,320	9	—	—	—	870.0	—	PROD / D	D	—	—	JEWELL DEVELOPMENT,
B(21-15) 05DDA	Wells55	542672	—	—	—	237,141	3,901,910	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	COOK, KEVIN,
B(21-15) 07ACA	GWSI	—	—	351310113543701	—	235,099	3,901,075	—	—	—	—	—	—	1/16/2006	—	—	—	—	—	—	—
B(21-15) 07ACA	Wells55	585433	—	—	—	235,103	3,901,185	4/4/2001	800	- 20	7	—	—	—	—	—	X / NONE	D	—	—	REED, JULIA
B(21-15) 07ACA	Wells55	588910	—	—	—	235,103	3,901,168	—	1,470	- 1,460	5	—	—	—	1,025.0	—	PROD / D	D	—	—	REED, JULIA
B(21-15) 07BCB	Wells55	202045	—	—	—	234,102	3,901,195	—	1,170	- 1,170	6	—	—	—	770.0	—	PROD / D	D	—	—	TEX & SLIM LLC
B(21-15) 07CAC	Wells55	541323	—	—	—	234,486	3,900,582	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	JOHNSON, JAMES,K
B(21-15) 07DBC	Wells55	541703	—	—	—	234,886	3,900,570	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	DOLPH, MATTHEW
B(21-15) 07DCB	Wells55	210760	—	—	—	234,881	3,900,369	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BUKER, ROBERT OR JANIC
B(21-15) 07DCD	Wells55	597395	—	—	—	235,076	3,900,162	—	605	- 605	6	—	—	—	448.0	—	PROD / D	D	5	4	BURLINGAME, CRAIG F
B(21-15) 09AAA	Wells55	529165	—	—	—	239,733	3,901,460	9/15/1990	760	- 300	5	—	—	—	680.0	—	PROD / D	D	—	—	RAMOS, LOUIS,
B(21-15) 09CBD	Wells55	208729	—	—	—	237,504	3,900,488	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	GORDON, MICHAEL A
B(21-15) 09CBD	Wells55	901648	—	—	—	237,504	3,900,488	—	—	—	—	—	—	—	—	—	D	—	—	—	GORDON, MICHAEL A
B(21-15) 17AAA	Wells55	209482	—	—	—	237,084	3,899,896	—	790	- 790	5	—	—	—	640.0	—	PROD / D	D	—	—	BENSON, ANNA MARIE
B(21-15) 17ADA	GWSI	—	—	351226113531701	—	237,077	3,899,645	—	—	—	—	—	—	1/16/2006	—	—	—	—	—	—	—
B(21-15) 17ADB	Wells55	541923	—	—	—	236,871	3,899,501	1/11/1994	663	- 661	8	—	—	—	520.0	—	PROD / D	D	5	5	SHIELDS, LEWIS,T
B(21-15) 17BAD	GWSI	534901	—	351225113535201	—	236,194	3,899,658	4/11/1992	615	—	7	—	3,985	1/16/2006	489.7	3,495.3	PROD / D	D	—	—	EARL ENGLEHARDT
B(21-15) 17BAD	GWSI	534901	—	351225113535201	—	236,194	3,899,658	4/11/1992	615	- 615	6	525 - 615	3,985	1/16/2006	489.7	3,495.3	PROD / D	D	—	—	EARL ENGLEHARDT
B(21-15) 17BAC	Wells55	534901	—	—	—	236,070	3,899,727	4/11/1992	615	- 615	5	—	—	—	460.0	—	PROD / D	D	13	13	ENGELHARDT, EARL,C
B(21-15) 17BCB	Wells55	566081	—	—	—	235,661	3,899,538	3/19/1998	465	- 380	8	—	—	—	290.0	—	PROD / D	D	—	—	JAYNE, GALEN
B(21-15) 17BCB	Wells55	572372	—	—	—	235,661	3,899,538	9/17/1998	400	- 396	4	—	—	—	240.0	—	PROD / D	D	7	8	JAYNE, GALEN
B(21-15) 17BCC	GWSI	—	—	351216113541001	—	235,731	3,899,391	—	—	—	—	—	3,989	1/16/2006	280.5	3,718.5	—	—	—	—	—
B(21-15) 17BDB	GWSI	517022	—	351220113535801	—	236,002	3,899,500	5/6/1987	740	0 - 13	13	—	4,000	38733	470.1	3,529.9	U	D	—	—	F R COLLINS
B(21-15) 17BDB	GWSI	517022	—	351220113535801	—	236,002	3,899,500	5/6/1987	740	0 - 716	6	616 - 716	4,000	38733	470.1	3,529.9	U	D	—	—	F R COLLINS
B(21-15) 17BDB	GWSI	517022	—	351220113535801	—	236,002	3,899,500	5/6/1987	740	0 - 716	6	716 - 740	4,000	38733	470.1	3,529.9	U	D	—	—	F R COLLINS
B(21-15) 17BDB	Wells55	517022	—	—	—	236,064	3,899,526	5/6/1987	740	- 716	6	—	—	—	452.0	—	PROD / D	D	7	5	TOWNSEND, ELDON V
B(21-15) 17CCB	Wells55	584422	—	—	—	235,639	3,898,733	3/1/2001	735	- 735	6	—	—	—	315.0	—	PROD / C	D	100	99	LOVE, GREG
B(21-15) 17CDB	Wells55	205538	—	—	—	236,043	3,898,721	3/8/2005	814	- 814	7	—	—	—	416.0	—	PROD / C	D	—	—	FREEDOM TRUCK WASH
B(21-15) 17DBB	Wells55	574488	—	—	—	236,457	3,899,111	6/22/1999	440	- 438	4	—	—	—	335.0	—	PROD / D	D	—	—	OVERSON, BEN
B(21-15) 17DDC	GWSI	505193	—	351152113532601	—	236,824	3,898,806	9/20/1983	520	0 -	6	—	4,130	2/13/1991	—	—	U	D	—	—	JOHN CROOKS
B(21-15) 17DBD	Wells55	505193	—	—	—	236,653	3,898,904	9/30/1983	520	—	—	—	—	—	—	—	X / D	D	—	—	HODGES,J C

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY,
MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(21-15) 17DDC	Wells55	544254	—	—	—	238,843	3,898,495	7/27/1994	763	- 757	8	—	—	—	630.0	—	PROD / D	D	10	8	NOWELL, ROWLAND,
B(21-15) 19DAB	GWSI	631349	—	351127113541301	—	235,148	3,897,576	1/1/1960	152	0 -	6	—	4,230	12/2/1985	70.0	4,161.0	PROD / S	D	4	4	BLM
B(21-15) 19AAC	Wells55	631349	—	—	—	235,218	3,898,143	12/1/1960	152	- 137	6	—	—	—	120.0	—	PROD / S	—	4	4	BLM-PHOENIX DISTRICT,
B(21-15) 19ACD	Wells35	—	13555	—	—	235,006	3,897,747	1/1/1960	152	—	6	—	—	—	78.0	—	PROD / A	D	—	4	—
B(21-15) 19AC	GWSI	—	—	351131113542601	—	235,288	3,898,004	—	—	—	—	—	4,050	—	—	—	PROD / S	—	—	—	—
B(21-15) 20BA	Wells55	540039	—	—	—	236,128	3,898,215	11/9/1993	500	—	85	—	—	—	240.0	—	NONE	D	—	—	EL PASO NATURAL GAS,
B(21-15) 20BDD	Wells35	—	13556	—	—	236,214	3,897,710	—	80	—	6	—	—	—	—	—	PROD / A	P	—	—	—
B(21-15) 20CAB	GWSI	—	—	351114113535501	—	236,057	3,897,457	—	—	0 -	8	—	4,255	12/2/1985	87.0	4,168.0	PROD / S	—	—	—	GETZ RANCH
B(21-15) 20CAD	GWSI	604198	—	351120113535501	55-631356	236,257	3,898,253	—	140	0 -	8	—	4,280	1/7/1991	81.0	4,199.0	PROD / S	—	—	—	BLM
B(21-15) 20CAD	GWSI	604198	—	351120113535501	55-631356	236,257	3,898,253	—	140	0 -	8	—	4,280	1/7/1991	81.0	4,199.0	PROD / S	—	—	—	WF CATTLE CO
B(21-15) 20CAD	Wells55	604198	—	—	—	236,203	3,897,309	—	140	- 20	8	—	—	—	80.0	—	PROD / S	—	8	8	WF CATTLE CO INC.
B(21-15) 20CAD	Wells55	631356	—	—	—	236,203	3,897,309	12/1/1974	391	- 152	8	—	—	—	82.0	—	PROD / S	—	6	6	BLM-PHOENIX DISTRICT,
B(21-15) 22DD	GWSI	—	—	351100113512001	—	239,966	3,898,912	—	—	—	—	—	5,390	—	—	—	PROD / D	—	—	—	—
B(21-15) 25CAC	Wells55	562977	—	—	—	242,390	3,895,517	7/26/1997	1,240	- 1,180	8	—	—	—	670.0	—	PROD / D	D	—	—	OVERSON, GARY & LINDA D
B(21-15) 28BDD	GWSI	—	—	351030113504501	—	240,825	3,895,962	—	48	—	—	—	4,440	4/7/1952	15.0	4,425.0	PROD / S	—	—	—	—
B(21-15) 28BDD	Wells35	—	13557	—	—	240,991	3,895,959	—	48	—	6	—	—	—	15.0	—	PROD / A	P	—	—	—
B(21-15) 26CAD2	GWSI	631355	—	351016113504501	—	240,813	3,895,530	8/31/1970	220	0 - 220	7	40 - 60	4,482	1/7/1991	61.0	4,421.0	PROD / S	D	20	20	GETZ RANCH
B(21-15) 26CAD2	GWSI	631355	—	351016113504501	—	240,813	3,895,530	8/31/1970	220	0 - 220	7	80 - 120	4,482	1/7/1991	61.0	4,421.0	PROD / S	D	20	20	BLM
B(21-15) 26CAD2	GWSI	631355	—	351016113504501	—	240,813	3,895,530	8/31/1970	220	0 - 220	7	140 - 160	4,482	1/7/1991	61.0	4,421.0	PROD / S	D	20	20	GETZ RANCH
B(21-15) 26CAD2	GWSI	631355	—	351016113504501	—	240,813	3,895,530	8/31/1970	220	0 - 220	7	180 - 200	4,482	1/7/1991	61.0	4,421.0	PROD / S	D	20	20	BLM
B(21-15) 26CAC	Wells55	631355	—	—	—	240,780	3,895,562	9/1/1970	220	- 220	8	—	—	—	80.0	—	PROD / S	—	20	20	BLM-PHOENIX DISTRICT,
B(21-15) 26CAD	Wells35	—	13558	—	—	240,981	3,895,557	8/31/1970	220	0 - 220	7	40 - 200	—	—	47.0	—	PROD / A	D	—	20	GETZ RANCH
B(21-15) 28AAA	Wells55	589594	—	—	—	238,594	3,896,628	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ROLANDS, ROGER
B(21-15) 28BDB	GWSI	631354	—	351030113524201	—	237,864	3,896,047	—	212	—	—	—	4,450	1/1/1964	200.0	4,250.0	U	—	2	2	WEST WING ASSOCIATION
B(21-15) 28BAC	Wells55	631354	—	—	—	237,587	3,896,460	12/31/1967	212	- 212	8	—	—	—	120.0	—	PROD / D	—	5	—	WEST WING ASSOC.
B(21-15) 28BDB	Wells35	—	13561	—	—	237,582	3,896,259	—	212	—	—	—	—	—	200.0	—	X / K	P	—	2	—
B(21-15) 28BAC	Wells55	631340	—	—	—	237,587	3,896,460	1/1/1968	315	- 315	6	—	—	—	160.0	—	PROD / S	—	10	10	WEST WING ASSOC.
B(21-15) 28BCA	Wells55	580416	—	—	—	237,382	3,896,266	5/6/2000	245	- 245	5	—	—	—	70.0	—	PROD / D	D	—	—	KAVANAUGH, FRANK
B(21-15) 28BCA1	GWSI	—	—	351036113525301	—	237,593	3,896,302	—	200	—	—	—	4,400	—	—	—	PROD / S	D	—	—	—
B(21-15) 28BCA	Wells35	—	13559	—	—	237,382	3,896,266	—	200	—	—	—	—	—	110.0	—	PROD / A	D	—	—	—
B(21-15) 28BCA2	GWSI	—	—	351039113525301	—	237,594	3,896,332	—	450	—	—	—	4,400	1/1/1964	110.0	4,290.0	PROD / S	—	—	—	—
B(21-15) 28BCA	Wells35	—	13560	—	—	237,382	3,896,266	—	450	—	—	—	—	—	110.0	—	PROD / A	P	—	—	—
B(21-15) 28BCD	Wells55	584113	—	—	—	237,376	3,896,065	11/23/2000	245	- 245	5	—	—	—	85.0	—	PROD / D	D	—	—	BOYETT, JEFF
B(21-15) 29AAA	GWSI	—	—	351050113531101	—	237,148	3,896,685	—	160	—	—	—	4,400	1/1/1964	80.0	4,320.0	PROD / S	—	6	6	—
B(21-15) 29AAA	Wells35	—	13562	—	—	236,991	3,896,682	—	160	—	—	—	—	—	80.0	—	PROD / A	P	—	6	—
B(21-15) 32AAC	Wells55	614877	—	—	—	236,737	3,894,877	—	63	- 63	3	—	—	—	—	—	PROD / S	—	—	—	AZ STATE LAND DEPT,
B(21-15) 33BBB	GWSI	631348	—	350955113530001	—	237,075	3,895,021	1/1/1963	700	—	—	—	4,820	1/1/1964	75.0	4,545.0	PROD / D	—	12	12	B J LOGAN
B(21-15) 33BBB	Wells55	631348	—	—	—	237,147	3,895,064	10/1/1963	700	- 536	8	—	—	—	180.0	—	PROD / D	—	10	10	LOGAN,,B J
B(21-15) 33BBB	Wells35	—	13563	—	—	237,147	3,895,064	1/1/1963	700	—	—	—	—	—	75.0	—	PROD / IND	P	—	12	—
B(21-16) 03BAB	Wells55	553041	—	—	—	229,742	3,903,340	2/2/1996	800	- 728	8	—	—	—	668.0	—	PROD / I	D	—	—	ZBELLA INVESTMENTS LLC
B(21-16) 03BBA	Wells55	597133	—	—	—	229,541	3,903,346	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ZBELLA INVESTMENTS LLC
B(21-16) 03CCA	Wells55	546817	—	—	—	229,504	3,902,144	2/20/1995	850	- 850	7	—	—	—	735.0	—	PROD / I	D	20	18	ZBELLA INVESTMENTS LLC
B(21-16) 04AAA	Wells55	597134	—	—	—	229,139	3,903,360	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ZBELLA INVESTMENTS LLC
B(21-16) 06AAD	Wells55	808652	—	—	—	225,850	3,903,259	—	880	- 880	9	—	—	—	400.0	—	PROD / D	—	30	—	SCHOTT, RICHARD & GLORI
B(21-16) 06AAD	Wells55	808653	—	—	—	225,850	3,903,259	—	500	- 500	5	—	—	—	395.0	—	PROD / I	—	30	—	SCHOTT, RICHARD & GLORI
B(21-16) 06AAD	Wells55	808654	—	—	—	225,850	3,903,259	—	500	- 500	5	—	—	—	398.0	—	PROD / S	—	20	—	SCHOTT, RICHARD & GLORI
B(21-16) 06CBB	Wells55	617205	—	—	—	223,541	3,902,720	2/1/1977	480	—	8	—	—	—	310.0	—	PROD / I	—	10	10	LINGENFELTER, JOHN G
B(21-16) 06CBB	Wells35	—	13565	—	35-42496	223,541	3,902,720	1/1/1977	480	—	—	—	—	—	310.0	—	PROD / I	D	—	—	LINGENFELTER , JOHN
B(21-16) 06CCC	Wells55	587082	—	—	—	223,527	3,902,116	6/9/2001	800	- 680	5	—	—	—	390.0	—	PROD / D	D	—	—	LINGENFELTER, JOHN G
B(21-16) 07BBB	Wells35	—	37025	—	35-46344	223,521	3,901,914	5/1/1978	400	—	—	—	—	—	—	—	—	—	—	—	LINN, MAX
B(21-16) 07CBD	Wells55	481600	—	—	—	223,821	3,900,897	—	—	—	—	—	—	—	—	—	X / MON	—	—	—	CONOCO PHILLIPS COMPANY
B(21-16) 07CBD	Wells55	481601	—	—	—	223,821	3,900,897	—	—	—	—	—	—	—	—	—	X / MON	—	—	—	CONOCO PHILLIPS COMPANY
B(21-16) 07CBD	Wells55	481602	—	—	—	223,821	3,900,897	—	—	—	—	—	—	—	—	—	X / MON	—	—	—	CONOCO PHILLIPS COMPANY
B(21-16) 07CBD	Wells55	481603	—	—	—	223,821	3,900,897	—	—	—	—	—	—	—	—	—	X / MON	—	—	—	CONOCO PHILLIPS COMPANY
B(21-16) 07DAD	Wells55	537846	—	—	—	225,773	3,900,838	—	—	—	—	—	—	—	—	—	MON	—	—	—	CHEVRON USA,
B(21-16) 07DAD	Wells55	537847	—	—	—	225,773	3,900,838	—	—	—	—	—	—	—	—	—	MON	—	—	—	CHEVRON USA,
B(21-16) 07DAD	Wells55	537848	—	—	—	225,773	3,900,838	—	—	—	—	—	—	—	—	—	MON	—	—	—	CHEVRON USA,
B(21-16) 07DAD	Wells55	537849	—	—	—	225,773	3,900,838	—	—	—	—	—	—	—	—	—	MON	—	—	—	CHEVRON USA,
B(21-16) 07DAD	Wells55	537850	—	—	—	225,773	3,900,838	—	—	—	—	—	—	—	—	—	MON	—	—	—	CHEVRON USA,
B(21-16) 08ACB	Wells55	525934	—	—	—	226,860	3,901,414	—	—	—	—	—	—	—	—	—	MON	—	—	—	GROUNDWATER TECH INC,
B(21-16) 08B	Wells55	523920	—	—	—	226,361	3,901,527	—	—	—	—	—	—	—	—	—	K / NONE	—	—	—	GROUNDWATER TECH INC,
B(21-16) 08BCA	Wells55	502658	—	—	—	226,258	3,901,428	5/11/1982	157	- 21	8	—	—	—	—	—	U / MON	D	—	—	HUSKY OIL CO.
B(21-16) 08BDA	Wells55	570590	—	—	—	226,659	3,901,419	—	—	—	—	—	—	—	—	—	K / UNK	—	—	—	CFJ PROPERTIES
B(21-16) 08BDA	Wells55	577417	—	—	—	226,659	3,901,419	12/8/1999	170	—	—	—	—	—	—	—	K / NONE	D	—	—	CFJ PROPERTIES
B(21-16) 08BDA	Wells55	581966	—	—	—	226,659	3,901,419	1/9/2001	145	—	—	—	—	—	—	—	K / T	D	—	—	CFJ PROPERTIES

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(21-16) 12BBB	Wells55	529397	—	—	—	232,510	3,901,649	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	REZAC, WAYNE,
B(21-16) 13D	Wells55	535905	—	—	—	233,531	3,898,900	11/23/1982	600	- 600	8	—	—	—	28.0	—	NONE	D	—	—	TRANSWESTERN PIPELNE,
B(21-16) 14CDD	GWSI	631357	—	351151113565201	—	231,481	3,898,578	—	690	0 -	8	—	3,780	1/7/1991	482.0	3,298.0	U	—	2	2	—
B(21-16) 23BAA	Wells55	631357	—	—	—	231,404	3,898,460	12/1/1954	690	- 690	6	—	—	—	560.0	—	PROD / S	—	2	2	WEST WING ASSOC,
B(21-16) 14CDD	Wells35	—	13566	—	—	231,410	3,898,662	—	690	—	—	—	—	—	480.0	—	PROD / A	P	—	2	—
B(21-16) 20CDB	GWSI	—	—	351109114002201	—	226,344	3,897,816	—	—	—	—	—	3,655	1/20/2006	381.3	3,273.7	—	—	—	—	—
B(21-16) 17AAD	Wells35	—	37026	—	35-46382	227,420	3,899,990	7/15/1977	400	—	—	—	—	—	—	—	—	—	—	—	BROCK, GARY
B(21-16) 17ABB	Wells55	592706	—	—	—	226,822	3,900,206	—	505	- 790	6	—	—	—	505.0	—	PROD / D	D	—	—	FREIDAY, WILLIAM B
B(21-16) 17BBD	Wells55	582529	—	—	—	226,214	3,900,019	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	PATEL, NILAY
B(21-16) 18BDB	Wells55	572429	—	—	—	224,118	3,899,880	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	OUTLAND RESOURCES CORP
B(21-16) 23CBB	Wells35	—	37023	—	35-37245	230,775	3,897,672	8/1/1976	150	—	—	—	—	—	—	—	—	—	—	—	Lovell, Ralph
B(21-16) 23DBC	GWSI	—	—	351109113564301	—	231,801	3,897,428	—	30	—	—	—	3,935	3/11/1980	17.0	3,918.0	U	—	0	0	—
B(21-16) 23DBC	Wells35	—	13570	—	—	231,574	3,897,449	—	30	—	—	—	—	—	20.0	—	X / K	P	—	—	—
B(21-16) 24BDC	Wells55	631345	—	—	—	232,794	3,897,815	1/1/1949	86	- 86	6	—	—	—	60.0	—	PROD / S	—	3	3	BLM-PHOENIX DISTRICT,
B(21-17) 01AAA	Wells55	504730	—	—	—	223,322	3,904,066	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	POPE,G
B(21-17) 01AAA	Wells55	517620	—	—	—	223,322	3,904,066	3/27/1958	400	- 400	7	—	—	—	310.0	—	PROD / D	D	—	—	RICCA, JAMES B,
B(21-17) 01AAA	Wells55	522768	—	—	—	223,322	3,904,066	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	POPE, GARY,
B(21-17) 01AAA	Wells55	529039	—	—	—	223,322	3,904,066	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	POPE, GARY,
B(21-17) 01AAB	Wells55	210911	—	—	—	223,122	3,904,072	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	CARLSON, WILLIAM E & REN
B(21-17) 01AAB	Wells55	586644	—	—	—	223,122	3,904,072	5/2/2001	355	- 355	5	—	—	—	320.0	—	PROD / D	D	—	—	NELSON, DONALD
B(21-17) 01AAC	Wells55	512747	—	—	—	223,115	3,903,867	3/14/1986	260	- 260	7	—	—	—	210.0	—	PROD / D	D	15	—	SHORT, VIRGIL,C
B(21-17) 01ABA	Wells55	210132	—	—	—	222,923	3,904,077	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	NEAL, JOHN T
B(21-17) 01ABB	Wells55	514962	—	—	—	222,724	3,904,082	12/8/1986	235	- 235	7	—	—	—	180.0	—	PROD / D	D	15	—	BRACKETT, ROBERT,R
B(21-17) 01BDD	Wells55	202858	—	—	—	222,501	3,903,466	—	305	- 305	8	—	—	—	215.0	—	PROD / D	D	—	—	MATCHAM, JOYCE
B(21-17) 01BDD	Wells55	205936	—	—	—	222,501	3,903,465	1/25/2005	305	- 305	5	—	—	—	147.0	—	PROD / D	D	—	—	CAZALET JR, JOHN
B(21-17) 01BDD	Wells55	205937	—	—	—	222,501	3,903,466	1/26/2005	480	- 478	5	—	—	—	337.0	—	PROD / D	D	—	—	CAZALET SR, JOHN
B(21-17) 01BDD	Wells55	205939	—	—	—	222,501	3,903,466	1/24/2005	655	- 655	5	—	—	—	200.0	—	PROD / D	D	—	—	MCCALL, WILLIAM M
B(21-17) 01BDD	Wells55	205940	—	—	—	222,501	3,903,466	1/21/2005	255	- 255	5	—	—	—	168.0	—	PROD / D	D	—	—	BOSS, MARIANNE
B(21-17) 01CAB	GWSI	—	—	351403114025501	—	222,553	3,903,074	—	503	—	—	—	3,400	12/1/1963	115.0	3,285.0	PROD / MUN	—	300	300	J L NEAL
B(21-17) 01CAB	Wells35	—	13579	—	—	222,293	3,903,262	6/1/1963	500	0 - 500	8	115 - 500	—	—	115.0	—	PROD / D	P	—	300	NEAL , J
B(21-17) 01DBC	Wells55	602069	—	—	—	222,686	3,903,051	1/1/1977	350	- 350	8	—	—	—	240.0	—	PROD / D	—	28	26	AM-PAK ENT LLC,
B(21-17) 01DBC	Wells35	—	13580	—	35-44845	222,688	3,903,051	6/28/1977	350	0 - 350	8	270 - 350	—	—	240.0	—	PROD / I	D	—	30	LARSON , L
B(21-17) 01DBD	Wells55	503400	—	—	—	222,888	3,903,050	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	STACK P J
B(21-17) 01DDD	Wells55	528516	—	—	—	223,272	3,902,838	6/1/1990	268	- 268	6	—	—	—	187.0	—	PROD / D	D	20	30	FAST, IVAN J. & LUCRE
B(21-17) 01DDD	Wells55	599952	—	—	—	223,272	3,902,838	—	—	- 400	5	—	—	—	233.0	—	PROD / D	D	—	—	SHUFFLER, B L
B(21-17) 12AA	Wells55	608953	—	—	—	223,163	3,902,333	1/1/1970	350	- 350	10	—	—	—	200.0	—	PROD / I	—	60	80	COFER,C C
B(21-17) 13DAA	Wells55	542913	—	—	—	223,206	3,900,012	3/26/1994	623	- 623	6	—	—	—	260.0	—	PROD / D	D	25	30	NUGENT, WILLIAM,L
B(21-17) 13DAB	Wells55	526129	—	—	—	222,998	3,900,009	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	MAYS, MELVIN,
B(22-14) 06CBC	Wells55	512179	—	—	—	244,060	3,911,581	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	HALLFORD,J
B(22-14) 30ABD	GWSI	—	—	351557113480801	—	245,082	3,905,926	—	30	—	—	—	4,000	—	—	—	U	—	1	1	—
B(22-14) 30ABD	Wells35	—	13685	—	—	244,898	3,905,915	—	30	—	—	—	—	—	—	—	X / K	P	—	1	—
B(22-14) 30CAB	Wells55	604200	—	—	—	244,282	3,905,328	—	160	- 160	6	—	—	—	140.0	—	PROD / S	—	2	2	WF CATTLE CO INC,
B(22-14) 30CBA	GWSI	—	—	351533113463801	—	244,303	3,905,208	—	180	—	—	—	4,000	1/1/1965	110.0	3,890.0	PROD / D	—	15	15	—
B(22-14) 30CBA	Wells35	—	13686	—	—	244,083	3,905,334	—	180	—	—	—	—	—	110.0	—	PROD / D	P	—	15	—
B(22-14) 30CBA	Wells55	579296	—	—	—	244,083	3,905,334	2/12/2000	320	- 320	5	—	—	—	240.0	—	PROD / D	D	25	22	W.F. CATTLE COMPANY
B(22-15) 09CAA	Wells55	566890	—	—	—	238,183	3,910,337	4/17/1998	625	- 20	7	—	—	—	—	—	PROD / D	D	—	—	MARTINO, DOMINICK
B(22-15) 19CBB	M&A	903521	—	—	PH-1	234,221	3,907,285	1/3/2006	1,508	0 - 39	30	—	3,383	1/24/2006	623.0	2,760.0	PROD / MUN	D, G, P, R	—	2,870	RHODES HOMES-ARIZONA, LLC
B(22-15) 19CBB	M&A	903521	—	—	PH-1	234,221	3,907,285	1/3/2006	1,508	0 - 1,490	18	729 - 1,480	3,383	1/24/2006	623.0	2,760.0	PROD / MUN	D, G, P, R	—	2,870	RHODES HOMES-ARIZONA, LLC
B(22-15) 20C	Wells55	632991	—	—	—	236,172	3,906,670	8/30/1963	195	- 195	12	—	—	—	95.0	—	PROD / D	—	5	5	A T & T CO,
B(22-15) 23CAD	GWSI	502288	—	351620113503701	—	241,336	3,906,742	3/27/1982	480	0 - 20	8	—	3,760	11/7/1995	401.0	3,359.0	U	D	—	—	SHEILA PIHS
B(22-15) 23CAD	GWSI	502288	—	351620113503701	—	241,336	3,906,742	3/27/1982	480	0 - 480	4	400 - 480	3,760	11/7/1995	401.0	3,359.0	U	D	—	—	SHEILA PIHS
B(22-15) 23CAC	Wells55	502288	—	—	—	241,104	3,906,832	3/27/1982	480	- 480	8	—	—	—	400.0	—	PROD / D	D	5	5	PIHS,S
B(22-15) 23CCD	Wells55	209751	—	—	—	240,892	3,906,435	12/19/2005	600	- 600	5	500 - 600	—	—	465.0	—	PROD / D	D	—	—	MOLLER, KAI
B(22-15) 24ADC	GWSI	—	—	351638113485901	—	243,829	3,907,226	—	38	—	—	—	4,000	1/26/1965	—	—	PROD / S	—	—	—	—
B(22-15) 24DAB	GWSI	—	—	351625113485801	—	243,843	3,906,825	—	180	—	—	—	4,000	—	—	—	PROD / S	—	3	3	—
B(22-15) 24DAB	Wells35	—	13689	—	—	243,526	3,906,964	—	180	—	—	—	—	—	—	—	PROD / A	P	—	3	—
B(22-15) 26	Wells55	806241	—	—	—	241,370	3,905,515	6/24/1967	1,025	- 662	14	—	—	—	583.0	—	PROD / IND	—	750	—	PENN CENTRAL CORP,
B(22-15) 33BBB	Wells55	904459	—	—	—	237,448	3,904,668	—	—	—	—	—	—	—	—	—	PROD / MUN	—	—	—	SEDORA HOLDINGS, LLC
B(22-15) 33BBB	M&A	904410	—	—	PH-A	237,448	3,904,668	3/26/2006	1,483	0 - 740	6	—	3,611	4/12/2006	849.0	2,762.0	PROD / MUN	G	—	—	SEDORA HOLDINGS, LLC
B(22-15) 33CCC	Wells55	527749	—	—	—	237,381	3,903,310	7/20/1990	625	- 622	6	—	—	—	535.0	—	PROD / D	D	—	—	PRESNAL, RICHARD & CONST
B(22-15) 33DBD	M&A	604197	—	—	—	238,430	3,903,697	—	—	—	—	—	—	—	—	—	—	—	—	—	—
B(22-15) 33DBD	GWSI	604197	—	351436113520201	—	238,430	3,903,695	1/1/1965	1,220	0 -	6	—	3,687	1/10/2006	924.8	2,762.2	PROD / S	D, G	10	10	WF CATTLE CO
B(22-15) 33DBD	Wells55	604197	—	—	—	238,398	3,903,687	—	1,235	- 1,235	8	—	—	—	900.0	—	PROD / S	—	9	9	WF CATTLE CO INC,
B(22-15) 33DAD	Wells35	—	13690	—	—	238,797	3,903,677	—	1,220	—	—	—	—	—	912.0	—	PROD / A	—	—	10	—

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY,
MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(22-15) 35BDB	GWSI	—	—	351459113503601	—	240,961	3,904,255	1/1/1963	422	0 - 5	8	—	3,750	2/29/1980	—	—	U	D	—	—	—
B(22-15) 35BDB	Wells35	—	13691	—	—	241,032	3,904,214	1/1/1963	450	—	—	—	—	—	—	—	X / K	D	—	—	—
B(22-16) 01DCC	M&A	606422	—	—	—	233,528	3,911,414	—	589	0 - 589	16	458 - 589	—	—	—	—	—	—	—	—	—
B(22-16) 01DCC	GWSI	606422	—	351844113555101	35-28464	233,531	3,911,414	10/1/1974	595	0 - 195	16	—	3,234	1/11/2006	461.9	2,772.1	U	D	—	—	LEONARD NEAL
B(22-16) 01DCC	GWSI	606422	—	351844113555101	STUCKEY WELL	233,531	3,911,414	10/1/1974	595	195 - 595	18	460 - 595	3,234	1/11/2006	461.9	2,772.1	U	D	—	—	LEONARD NEAL
B(22-16) 01DCC	Wells55	606422	—	—	—	233,614	3,911,478	1/1/1976	1,000	- 1,000	20	—	—	—	450.0	—	PROD / I	—	600	600	HAFLEY FAMILY LTD,
B(22-16) 01DCC	Wells35	—	13692	351844113555101	35-28464	233,614	3,911,478	10/7/1974	595	0 - 595	16	460 - 560	—	—	140.0	—	PROD / I	D	—	—	NEAL , J
B(22-16) 02ABD	GWSI	—	—	351928113564901	—	232,099	3,912,814	—	—	—	—	—	3,203	1/17/2006	397.3	2,805.7	—	—	—	—	—
B(22-16) 02ABD	Wells55	572015	—	—	—	232,238	3,912,729	2/16/1999	650	- 480	4	—	—	—	400.0	—	MIN / T	D	—	—	CITY OF KINGMAN
B(22-16) 03CBB	GWSI	805941	—	351907113582801	INDEX BK29, 35-25271	229,633	3,912,283	11/15/1973	970	0 - 970	20	600 - 960	3,325	10/24/2005	575.0	2,750.0	U	D	—	—	—
B(22-16) 03CBB	Wells55	805941	—	—	—	229,604	3,912,208	12/31/1974	—	—	20	—	—	—	2,120.0	—	U / NONE	—	—	—	HAFLEY FAMILY LTD,
B(22-16) 03CBA	Wells35	—	13693	351907113582801	35-25271	229,805	3,912,202	11/15/1973	970	0 - 970	20	600 - 960	—	—	430.0	—	PROD / I	D	—	—	NEAL , J
B(22-16) 03CBB	Wells55	808404	—	—	—	229,604	3,912,208	1/1/1974	—	—	—	—	—	—	—	—	PROD / S	—	—	—	LINGENFELTER INVESTMENTS
B(22-16) 03CBB	Wells35	—	13694	—	—	229,604	3,912,208	1/1/1973	970	- 600	20	—	—	—	540.0	—	PROD / D	D	—	—	—
B(22-16) 05ABC	Wells55	208533	—	—	—	227,207	3,912,886	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WILLIAMS, DARRELL
B(22-16) 05BBA	Wells55	542681	—	—	—	226,610	3,913,103	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	CALE, DARREL,W
B(22-16) 05CCD	Wells55	588071	—	—	—	226,569	3,911,689	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	MEYER, PETE
B(22-16) 05CDC	Wells55	542551	—	—	—	226,770	3,911,693	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	TEETER, JAMES,L
B(22-16) 05CDD	Wells55	208291	—	—	—	226,970	3,911,687	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	JAMES, WEST
B(22-16) 05DAA	Wells55	590540	—	—	—	227,792	3,912,267	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	RIEDLINGER, MARK
B(22-16) 05DAB	Wells55	541022	—	—	—	227,591	3,912,272	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BERONE, MICHAEL,G
B(22-16) 05DBA	Wells55	202610	—	—	—	227,390	3,912,278	4/13/2004	1,000	- 1,000	5	—	—	—	690.0	—	PROD / D	D	—	—	BARONE, MICHAEL & JUNE
B(22-16) 06AAB	Wells55	511709	—	—	—	225,824	3,913,127	7/11/1986	415	- 20	10	—	—	—	—	—	U / D	D	—	—	BOEHME,D
B(22-16) 06ACA	Wells55	208366	—	—	—	225,490	3,912,736	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	PAVEY, MICHAEL A
B(22-16) 06ACC	Wells55	508855	—	—	—	225,163	3,912,546	8/9/1984	940	- 940	8	—	—	—	840.0	—	PROD / D	D	—	—	CONNELL,S
B(22-16) 06ACD	Wells55	552313	—	—	—	225,485	3,912,536	11/14/1985	950	- 950	7	—	—	—	680.0	—	PROD / D	D	6	—	NOLI, EDWARD,G
B(22-16) 06CDB	Wells55	205342	—	—	—	224,500	3,911,866	—	790	- 790	5	—	—	—	606.0	—	PROD / D	D	—	—	TURNLEY, MARK L
B(22-16) 06CDB	Wells55	540693	—	—	—	224,500	3,911,966	8/25/1994	525	- 20	7	—	—	—	—	—	PROD / D	D	—	—	PENROD, BRENT,
B(22-16) 06CDC	Wells55	559902	—	—	—	224,494	3,911,765	12/28/1986	600	- 600	7	—	—	—	480.0	—	PROD / D	D	—	—	MCCONAHA, ROSE MARIE,
B(22-16) 06CDC	Wells55	588073	—	—	—	224,494	3,911,765	8/17/2001	525	- 525	5	—	—	—	450.0	—	PROD / D	D	10	5	FREE, MITCH & RITA
B(22-16) 06CDD	Wells55	553394	—	—	—	224,816	3,911,755	5/6/1996	970	—	—	—	—	—	—	—	PROD / D	D	—	—	CHAPMAN, MICHAEL,
B(22-16) 06DBA	Wells55	592826	—	—	—	225,479	3,912,336	7/5/2002	850	- 650	7	—	—	—	745.0	—	PROD / D	D	—	8	BENKER, LOTTI B
B(22-16) 06DCC	Wells55	568668	—	—	—	225,139	3,911,745	4/10/1999	895	- 895	5	—	—	—	760.0	—	PROD / D	D	10	8	HAMILTON, RICHARD AND MAR
B(22-16) 07ABD	Wells55	534005	—	—	—	225,446	3,911,331	4/20/1992	870	- 870	7	—	—	—	780.0	—	PROD / D	D	16	19	MINTER, JASON,
B(22-16) 07ABD	Wells55	586797	—	—	—	225,446	3,911,331	5/10/2001	880	- 880	5	—	—	—	820.0	—	PROD / D	D	—	—	WORKS, RON
B(22-16E) 07ADD	GWSI	622184	—	351820114004201	JORDAN-COURTNEY WELL	225,157	3,910,892	—	880	—	—	—	3,460	11/8/1995	700.0	2,760.0	U	—	—	—	—
B(22-16) 07ADD	Wells55	622184	—	—	—	225,080	3,910,907	5/1/1968	880	—	12	—	—	—	—	—	PROD / D	—	630	630	NEAL, GRACE,
B(22-16) 07BAB	Wells55	207921	—	—	—	224,485	3,911,564	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	TURNBOW FAMILY TRUST
B(22-16) 07BBA	Wells55	552526	—	—	—	224,182	3,911,574	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BASCLE, EULA,S
B(22-16) 07BBA	Wells55	560978	—	—	—	224,182	3,911,574	1/26/1997	827	- 827	8	—	—	—	700.0	—	PROD / D	D	—	—	BASCLE, EULA,S
B(22-16) 07BBB	Wells55	576620	—	—	—	223,840	3,911,585	8/23/1999	940	- 20	6	—	—	—	890.0	—	PROD / D	D	—	—	ESTES, WILLIAM
B(22-16) 07BBD	Wells55	549586	—	—	—	224,156	3,911,373	7/20/1995	620	—	7	—	—	—	480.0	—	PROD / D	D	—	—	KLEIN, JOSHUA
B(22-16) 07CBB	Wells55	597397	—	—	—	223,814	3,910,781	—	537	- 537	4	—	—	—	519.0	—	PROD / D	D	—	—	HONSINGER, MARIAN L
B(22-16) 07CCB	Wells55	590014	—	—	—	223,800	3,910,379	1/26/2002	800	- 800	5	—	—	—	697.0	—	PROD / D	D	5	5	MEDLIN, BRANDON
B(22-16) 07CCC	Wells55	501664	—	—	—	223,793	3,910,178	2/19/1982	850	- 850	4	—	—	—	690.0	—	PROD / D	D	50	50	PATULA, PAUL,J
B(22-16) 07CCC	Wells55	515147	—	—	—	223,793	3,910,178	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ESTES, BILL,
B(22-16) 07CCC	Wells55	555650	—	—	—	223,793	3,910,178	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ESTES, WILLIAM,
B(22-16) 07CCC	Wells55	556570	—	—	—	223,793	3,910,178	10/20/1996	622	- 578	8	—	—	—	594.0	—	PROD / D	D	—	—	HARMAN, ERNEST
B(22-16) 07CCC	Wells55	207833	—	—	—	223,793	3,910,178	—	—	—	—	—	—	—	—	—	PROD / D	—	5	5	CORSAIR, DONALD
B(22-16) 07CDA	Wells55	902881	—	—	—	224,770	3,910,346	—	—	—	—	—	—	—	—	—	D	—	—	—	SERNA, ARTHUR & KATHER
B(22-16E) 07DAA	GWSI	624996	—	351817114004101	CERBAT RANCHES	226,180	3,910,799	10/1/1977	1,000	0 - 1,000	16	680 - 1,000	3,455	11/8/1995	698.0	2,757.0	PROD / MUN	D	—	—	CLAUDE NEAL
B(22-16) 07DAA	Wells55	624996	—	—	—	226,074	3,910,706	10/20/1977	1,000	- 1,000	16	—	—	—	670.0	—	PROD / D	—	6,000	6,000	NEAL, CLAUDE,
B(22-16) 07DAA	Wells35	—	13695	—	35-47553	226,074	3,910,706	10/20/1977	1,000	0 - 1,000	16	680 - 1,000	—	—	—	—	PROD / D	D	—	—	NEAL , CLAUDE
B(22-16) 07DCC	Wells55	802999	—	—	—	225,087	3,910,134	—	—	—	—	—	—	—	—	—	—	D	—	—	FORSYTHE, WILLIAM E. & CH
B(22-16) 07DCC	Wells55	565798	—	—	—	225,087	3,910,134	2/1/1998	880	- 880	7	—	—	—	800.0	—	PROD / D	D	8	8	MEDLIN, TIM & ROBIN
B(22-16) 10BCC	Wells55	501157	—	—	—	229,560	3,910,801	—	900	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L. FAMILY,
B(22-16) 10CAA	Wells55	593058	—	—	Long Mountain Village No. 2	230,159	3,910,581	8/4/2002	1,020	- 1,020	18	781 - 1,008	—	—	526.0	—	PROD / MUN	D	—	—	LINGERFELTER INVESTMENTS
B(22-16) 10CAA	Wells55	593058	—	—	Long Mountain Village No. 2	230,159	3,910,581	8/4/2002	1,020	- 1,020	18	642 - 766	—	—	526.0	—	PROD / MUN	D	—	—	LINGERFELTER INVESTMENTS
B(22-16) 11DBC	GWSI	529463	—	351806113585001	—	231,875	3,910,467	11/9/1990	685	0 - 21	16	—	3,232	1/18/2006	475.1	2,756.9	PROD / MON	D	—	—	CITY OF KINGMAN
B(22-16) 11DBC	GWSI	529463	—	351806113585001	—	231,875	3,910,467	11/9/1990	685	0 - 650	8	510 - 640	3,232	1/18/2006	475.1	2,756.9	PROD / MON	D	—	—	CITY OF KINGMAN
B(22-16) 11DBC	GWSI	529463	—	351806113585001	—	231,875	3,910,467	11/9/1990	685	0 - 650	8	650 - 685	3,232	1/18/2006	475.1	2,756.9	PROD / MON	D	—	—	CITY OF KINGMAN
B(22-16) 11CAD	Wells55	529463	—	—	—	231,763	3,910,328	11/9/1990	685	- 650	16	—	—	—	423.0	—	MON	D	18	—	KINGMAN, CITY OF,
B(22-16) 11CAD	Wells55	532755	—	—	—	231,763	3,910,328	8/23/1991	30	- 30	2	—	—	—	—	—	MON	D	—	—	KINGMAN, CITY OF,
B(22-16) 11DBC	Wells55	532756	—	—	—	231,964	3,910,322	8/23/1991	30	- 30	2	—	—	—	—	—	MON	D	—	—	KINGMAN, CITY OF,
B(22-16) 11DCB	Wells55	532754	—	—	—	231,959	3,910,120	8/23/1991	30	- 30	2	—	—	—	—	—	MON	D	—	—	KINGMAN, CITY OF,

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY,
MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(22-16) 15AAB	Wells55	590897	—	—	—	230,739	3,909,756	3/10/2002	800	- 800	9	—	—	—	580.0	—	PROD / D	D	—	—	LINGENFELTER, JOHN G
B(22-16) 15CCC	GWSI	612657	—	351702113582701	LONG MOUNTAIN NO 6	229,487	3,908,410	2/1/1970	1,000	0 - 495	20	65 -	3,286	1/10/2006	549.1	2,737.0	PROD / MUN	D	1,575	1,575	CITY OF KINGMAN
B(22-16) 15CCC	GWSI	612657	—	351702113582701	LONG MOUNTAIN NO 6	229,487	3,908,410	2/1/1970	1,000	495 - 1,000	16	550 - 1,000	3,286	1/10/2006	549.1	2,737.0	PROD / MUN	D	1,580	1,580	CITY OF KINGMAN
B(22-16) 15CCC	Wells55	612657	—	—	—	229,490	3,908,386	10/10/1974	1,000	- 1,000	16	—	—	—	500.0	—	PROD / MUN	—	1,650	1,650	KINGMAN, CITY OF,
B(22-16) 15CCC	Wells35	—	13697	—	—	229,490	3,908,386	2/1/1970	1,000	0 - 1,000	16	0 - 450	—	—	500.0	—	PROD / UTIL	D	—	2,440	NEAL , J
B(22-16) 15CCC	Wells35	—	13698	—	—	229,490	3,908,386	1/1/1941	800	- 65	20	—	—	—	62.0	—	PROD / I	D	—	1,900	—
B(22-16) 17DDD1	GWSI	529815	—	351705113594001	CITY NO 6 TEST	227,646	3,908,438	2/6/1995	1,200	0 - 20	9	0 -	3,349	1/12/2006	612.2	2,736.8	T / MON	D	—	—	CITY OF KINGMAN
B(22-16) 17DDD1	GWSI	529815	—	351705113594001	CITY NO 6 TEST	227,646	3,908,438	2/6/1995	1,200	0 - 1,200	4	640 - 820	3,349	1/12/2006	612.2	2,736.8	T / MON	D	—	—	CITY OF KINGMAN
B(22-16) 17DDD1	GWSI	529815	—	351705113594001	CITY NO 6 TEST	227,646	3,908,438	2/6/1995	1,200	0 - 1,200	4	840 - 1,020	3,349	1/12/2006	612.2	2,736.8	T / MON	D	—	—	CITY OF KINGMAN
B(22-16) 17DDD1	GWSI	529815	—	351705113594001	CITY NO 6 TEST	227,646	3,908,438	2/6/1995	1,200	0 - 1,200	4	1,040 - 1,200	3,349	1/12/2006	612.2	2,736.8	T / MON	D	—	—	CITY OF KINGMAN
B(22-16) 17DDD	Wells55	529815	—	—	—	227,675	3,908,444	2/6/1991	1,200	- 1,200	8	—	—	—	650.0	—	MON	D	1,600	1,600	KINGMAN, CITY OF,
B(22-16) 17DDD2	GWSI	529816	—	351705113583901	CITY NO 6	227,676	3,908,440	6/27/1991	1,040	0 - 30	30	—	3,347	38729	—	—	PROD / MUN	D	1,585	1,585	CITY OF KINGMAN
B(22-16) 17DDD2	GWSI	529816	—	351705113583901	CITY NO 6	227,676	3,908,440	6/27/1991	1,040	0 - 1,040	18	740 - 800	3,347	38729	—	—	PROD / MUN	D	1,585	1,585	CITY OF KINGMAN
B(22-16) 17DDD2	GWSI	529816	—	351705113583901	CITY NO 6	227,676	3,908,440	6/27/1991	1,040	0 - 1,040	18	840 - 1,020	3,347	38729	—	—	PROD / MUN	D	1,585	1,585	CITY OF KINGMAN
B(22-16) 17DDD	Wells55	529816	—	—	—	227,675	3,908,444	6/27/1991	1,040	- 1,040	30	—	—	—	580.0	—	PROD / MUN	D	—	—	KINGMAN, CITY OF,
B(22-16E) 19BAA	GWSI	612658	—	351700114014001	LONG MOUNTAIN NO 4	225,206	3,908,401	1/1/1965	1,000	0 - 1,000	16	620 - 1,000	3,444	2/9/2006	734.4	2,709.8	PROD / MUN	D	858	858	CITY OF KINGMAN
B(22-16) 19BAA	Wells55	612658	—	—	—	224,702	3,908,334	1/1/1972	1,002	- 1,002	16	—	—	—	652.0	—	PROD / MUN	—	500	500	KINGMAN, CITY OF
B(22-16) 19BAA	Wells35	—	13698	—	—	224,702	3,908,334	1/1/1965	1,000	0 - 1,000	16	620 - 1,000	—	—	380.0	—	PROD / MUN	D	—	700	NEAL , J
B(22-16) 20CBC1	GWSI	—	—	351623114003601	—	226,184	3,907,281	—	—	—	—	—	3,371	1/12/2006	645.4	2,725.6	—	—	—	—	—
B(22-16) 20CBC	Wells55	571223	—	—	—	226,235	3,907,274	11/30/1998	1,200	- 700	4	—	—	—	550.0	—	MON / T	D	—	—	CITY OF KINGMAN
B(22-16) 20CBC	Wells55	591290	—	—	—	226,235	3,907,274	5/6/2002	1,050	- 39	18	—	—	—	—	—	X / MUN	D	—	—	CITY OF KINGMAN
B(22-16) 20DAA	GWSI	—	—	351630113593701	—	227,698	3,907,468	—	—	—	—	—	3,323	1/12/2006	590.6	2,732.4	—	—	—	—	—
B(22-16) 20DAA	Wells55	571222	—	—	—	227,648	3,907,437	11/30/1998	1,200	- 700	4	—	—	—	580.0	—	MON / T	D	—	—	CITY OF KINGMAN
B(22-16) 26ACB	Wells55	551701	—	—	—	231,840	3,906,095	—	—	—	—	—	—	—	—	—	K / NONE	—	—	—	KINGMAN AIRPORT,
B(22-16) 26BAC	GWSI	605484	—	351555113571501	—	231,424	3,906,270	1/1/1967	1,247	0 -	14	—	3,335	1/20/2006	586.3	2,748.7	PROD / IND	D, G	660	660	GENERAL CABLE
B(22-16) 26BAC	Wells55	605484	—	—	—	231,443	3,906,309	2/12/1967	1,247	- 1,235	14	—	—	—	574.0	—	PROD / IND	D	660	800	SOUTHWIRE COMPANY
B(22-16) 26BAC	Wells35	—	13699	—	—	231,443	3,906,309	1/1/1967	1,247	—	14	—	—	—	551.0	—	PROD / I	—	—	660	—
B(22-16) 26DCB	Wells55	205896	—	—	—	231,818	3,905,289	—	200	- 200	1	—	—	—	—	—	IND / T	D	—	—	CARL W HAYS ENTERPRISES
B(22-16) 27BBB	Wells55	206059	—	—	—	229,436	3,906,571	—	300	—	10	—	—	—	—	—	NONE / T	D	—	—	UNISOURCE ENERGY
B(22-16) 27DDD	GWSI	612667	—	351514113572801	CITY NO 1	230,883	3,905,028	3/5/1968	970	0 -	14	—	3,374	1/12/2006	628.7	2,744.9	PROD / MUN	D	700	700	CITY OF KINGMAN
B(22-16) 27DDD	Wells55	612667	—	—	—	230,804	3,905,118	3/28/1968	1,015	- 1,015	14	—	—	—	590.0	—	PROD / MUN	—	700	700	KINGMAN, CITY OF,
B(22-16) 28ACC	Wells35	—	13700	—	—	228,813	3,905,993	—	1,000	—	8	—	—	—	512.0	—	PROD / D	D	—	500	—
B(22-16) 28BAD	GWSI	612659	—	351554113590701	INDEX BK51, LONG MOUNTAIN NO 2	228,408	3,906,280	—	1,000	—	—	—	3,301	1/16/2006	567.2	2,733.8	U	D	—	—	CITY OF KINGMAN
B(22-16) 28BAD	Wells55	612659	—	—	—	228,424	3,906,403	1/1/1963	1,000	- 1,000	10	—	—	—	560.0	—	PROD / MUN	—	450	450	KINGMAN, CITY OF,
B(22-16) 28DBB	Wells35	—	13701	—	—	228,607	3,905,792	6/1/1963	1,000	0 - 1,000	10	515 - 980	—	—	520.0	—	PROD / D	D	—	500	NEAL , J
B(22-16) 28BDA2	GWSI	504272	—	351552113590801	WELL NO 5	228,430	3,906,243	12/3/1982	1,006	0 - 740	18	500 - 740	3,302	38733	—	—	PROD / MUN	D	2,128	2,128	CITY OF KINGMAN
B(22-16) 28BDA2	GWSI	504272	—	351552113590801	WELL NO 5	228,430	3,906,243	12/3/1982	1,006	0 - 740	18	740 - 1,006	3,302	38733	—	—	PROD / MUN	D	2,128	2,128	CITY OF KINGMAN
B(22-16) 28BDA	Wells55	504272	—	—	—	228,418	3,906,201	12/3/1982	1,006	- 740	18	—	—	—	531.0	—	PROD / MUN	D	2,400	2,400	KINGMAN, CITY OF,
B(22-16) 28BDA1	GWSI	502501	—	351552113590701	—	228,420	3,906,258	4/11/1982	1,105	0 - 1,054	1	554 - 1,054	1,105	—	—	—	PROD / MON	D	—	—	CITY OF KINGMAN
B(22-16) 28BDA1	GWSI	502501	—	351552113590701	—	228,420	3,906,258	4/11/1982	1,105	0 - 1,054	1	1,054 - 1,105	1,105	—	—	—	PROD / MON	D	—	—	CITY OF KINGMAN
B(22-16) 28CDA	Wells55	502501	—	—	—	228,394	3,905,396	4/11/1982	1,105	- 1,054	2	—	—	—	524.0	—	MON	D	—	—	KINGMAN, CITY OF,
B(22-16) 29AAA	GWSI	—	—	351604113593701	—	227,873	3,906,648	—	—	—	—	—	3,314	1/9/2006	587.4	2,726.6	—	—	—	—	—
B(22-16) 29AAA	Wells55	571224	—	—	—	227,626	3,906,631	11/30/1998	1,200	- 700	4	—	—	—	580.0	—	MON / T	D	—	—	CITY OF KINGMAN
B(22-16) 29AAA	Wells55	576713	—	—	—	227,626	3,906,631	11/20/1999	1,040	- 1,040	30	740 - 1,020	—	—	566.0	—	PROD / MUN	D	—	—	CITY OF KINGMAN
B(22-16) 31	Wells55	573767	—	—	—	224,740	3,904,397	—	—	—	—	—	—	—	—	—	—	—	—	—	LEEP AND PANSY
B(22-16) 31ACD	Wells55	643039	—	—	—	225,235	3,904,483	11/1/1978	800	- 770	8	—	—	—	664.0	—	PROD / D	—	15	15	PROSSER,E
B(22-16) 32DDD1	GWSI	—	—	351425113593601	—	227,604	3,903,596	—	—	—	—	—	3,380	1/10/2006	645.4	2,734.6	—	—	—	—	—
B(22-16) 32DDD2	GWSI	—	—	351425113593701	—	227,571	3,903,594	—	—	—	—	—	3,380	1/10/2006	645.5	2,734.5	—	—	—	—	—
B(22-16) 32DDD	Wells55	582951	—	—	—	227,536	3,903,611	3/23/2001	1,200	- 640	4	—	—	—	640.0	—	MON	D	—	—	CITY OF KINGMAN
B(22-16) 32DDD	Wells55	591289	—	—	—	227,536	3,903,611	6/14/2002	1,130	- 1,111	18	—	—	—	—	—	PROD / MUN	D	1,500	1,620	CITY OF KINGMAN
B(22-16) 33BCD	GWSI	612666	—	351452113592301	CITY NO 2	227,977	3,904,405	1/3/1971	1,050	0 - 1,050	16	550 - 1,050	3,354	38733	636.2	2,718.2	PROD / MUN	—	978	978	CITY OF KINGMAN
B(22-16) 33BCD	Wells55	612666	—	—	—	227,963	3,904,402	1/1/1968	1,040	- 1,040	16	—	—	—	60.0	—	PROD / MUN	—	900	900	KINGMAN, CITY OF,
B(22-16) 33BCC	Wells35	—	13702	—	—	227,761	3,904,408	3/15/1971	1,008	-1 - 1,008	16	640 - 990	—	—	—	—	PROD / D	D	—	1,000	KINGMAN MUNICIPAL WTR
B(22-16) 33CCD	Wells55	530645	—	—	—	227,940	3,903,598	1/27/1992	795	- 795	8	—	—	—	670.0	—	PROD / D	D	—	—	BROWN DRILLING,
B(22-16) 33CDC	GWSI	612665	—	351425113590501	CITY NO 3	228,163	3,903,502	1/1/1971	1,008	0 - 1,008	16	640 - 990	3,390	38733	657.7	2,732.5	PROD / MUN	—	1,298	1,298	CITY OF KINGMAN
B(22-16) 33CDC	Wells55	612665	—	—	—	228,141	3,903,592	8/1/1971	1,008	- 1,008	16	—	—	—	612.0	—	PROD / MUN	—	1,200	1,200	KINGMAN, CITY OF,
B(22-16) 33CDC	Wells35	—	13703	—	—	228,141	3,903,592	1/1/1971	1,008	0 - 1,008	16	640 - 990	—	—	600.0	—	X / C	D	—	—	Kingman Municipal Water System
B(22-16) 34BCA	Wells55	500156	—	—	—	229,577	3,904,551	7/20/1981	700	- 700	9	—	—	—	575.0	—	PROD / IND	D	100	100	DESERT CONST INC,
B(22-16) 34CBC	GWSI	612664	—	351439113583001	35-58166	229,289	3,903,842	4/5/1978	1,000	0 - 1,000	16	650 - 1,000	3,402	1/11/2006	676.7	2,724.9	PROD / MUN	D	1,075	1,075	CITY OF KINGMAN
B(22-16) 34CBC	GWSI	612664	—	351439113583001	CITY NO 4	229,289	3,903,842	4/5/1978	1,000	0 - 1,000	16	650 - 1,000	3,402	1/11/2006	676.7	2,724.9	PROD / MUN	G	955	955	CITY OF KINGMAN
B(22-16) 34CBC	Wells55	612664	—	—	—	229,358	3,903,955	4/5/1978	1,000	- 1,000	16	—	—	—	590.0	—	PROD / MUN	—	1,050	1,050	KINGMAN, CITY OF,
B(22-16) 34CBC	Wells35	—	13704	351439113583001	35-58166	229,358	3,903,955	4/5/1978	1,000	0 - 1,000	16	650 - 1,000	—	—	620.0	—	PROD / D	D	—	—	CITY OF KINGMAN
B(22-16E) 06BCD	GWSI	—	—	351911114013201	—	224,942	3,912,502	—	802	—	—	—	3,600	1/13/1986	—	—	U	—	—	—	—

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY,
MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(22-17) 11ABA	GWSI	625003	—	351858114034701	35-49286	221,519	3,912,207	12/1/1977	120	0 - 111	8	76 - 110	3,845	12/5/1985	58.0	3,788.0	U	D	—	—	CLAUDE NEAL
B(22-17) 11ABA	Wells55	625003	—	—	—	221,578	3,912,164	12/10/1977	120	- 111	8	—	—	—	46.0	—	PROD / D	—	30	30	NEAL, CLAUDE,
B(22-17) 11ABA	Wells35	—	13714	351858114034701	35-49286	221,578	3,912,164	12/10/1977	120	0 - 111	8	76 - 110	—	—	46.0	—	PROD / D	D	—	—	NEAL CLAUDE
B(22-17) 11BAA	Wells55	599167	—	—	—	221,172	3,912,176	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	SHIPLEY, LIRAY
B(22-17) 11BDD	Wells55	586324	—	—	—	221,156	3,911,566	5/25/2001	300	- 300	5	—	—	—	90.0	—	PROD / D	D	15	15	WERDZINSKI, GERMAINE
B(22-17) 11CAA	GWSI	602521	—	351828114040201	35-47691	221,112	3,911,294	9/1/1977	130	0 - 130	8	70 - 130	3,830	—	—	—	PROD / D	D	—	—	M VISSEPO-ARRIVI
B(22-17) 11CAA	GWSI	602521	—	351828114040201	35-47691	221,112	3,911,294	9/1/1977	130	0 - 130	8	70 - 130	3,830	—	—	—	PROD / D	D	—	—	S H DANIELS
B(22-17) 11CAB	Wells55	602521	—	—	—	220,949	3,911,368	3/1/1977	130	- 130	8	—	—	—	75.0	—	PROD / D	—	10	10	VISSEPO-ARRIVI, M &,B
B(22-17) 11CAB	Wells35	—	13715	351828114040201	35-47691	220,949	3,911,368	9/12/1977	130	0 - 130	8	70 - 130	—	—	—	—	PROD / D	D	—	—	DANIELS S
B(22-17) 11CAA	Wells55	535275	—	—	—	221,151	3,911,362	5/22/1992	315	- 315	5	—	—	—	100.0	—	PROD / D	D	7	2	BURGE, EVERETT,
B(22-17) 11CAB	Wells55	624995	—	—	—	220,949	3,911,368	12/6/1978	250	- 210	8	—	—	—	28.0	—	PROD / D	—	40	40	NEAL, CLAUDE,
B(22-17) 11CAB	Wells35	—	13716	—	35-70883	220,949	3,911,368	12/6/1978	250	0 - 210	8	40 - 210	—	—	28.0	—	PROD / D	D	—	—	NEAL CLAUDE
B(22-17) 11CAD	Wells55	204180	—	—	—	221,146	3,911,159	7/23/2004	620	- 60	7	—	—	—	—	—	PROD / D	D	—	—	NIELSEN, CHRIS
B(22-17) 11CAD	Wells55	204786	—	—	—	221,146	3,911,159	—	305	- 305	5	—	—	—	155.0	—	PROD / D	D	—	—	NIELSEN, CHRIS
B(22-17) 11CBA	Wells55	518161	—	—	—	220,747	3,911,373	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	NEAL, RICHARD,L
B(22-17) 11CBD	Wells55	594193	—	—	—	220,743	3,911,170	—	380	- 380	5	—	—	—	120.0	—	PROD / D	D	—	—	PALMQUIST, GARY AND CAROLI
B(22-17) 11CCB	Wells55	518159	—	—	—	220,538	3,910,971	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	NEAL, RICHARD,L
B(22-17) 11CCC	Wells55	902986	—	—	—	220,534	3,910,768	—	—	—	—	—	—	—	—	—	D	—	—	—	MCREYNOLDS, KEN & CRISTI
B(22-17) 11CCC	Wells55	208345	—	—	—	220,534	3,910,768	—	205	- 205	5	—	—	—	60.0	—	PROD / D	D	—	—	HENSHAW, CHRIS
B(22-17) 11CCC	Wells55	594765	—	—	—	220,534	3,910,768	1/9/2003	205	- 200	6	—	—	—	83.0	—	PROD / D	D	—	—	SANFILIPPO, JOSEPH JR
B(22-17) 11CCD	Wells55	206897	—	—	—	220,734	3,910,762	3/17/2005	255	- 250	5	—	—	—	170.0	—	PROD / D	D	—	—	GORDER, RANDY M
B(22-17) 11CDA	Wells55	594197	—	—	—	221,141	3,910,958	9/10/2002	305	- 305	6	—	—	—	80.0	—	PROD / D	D	5	2	ENLOW, DON AND MARY
B(22-17) 11CDB	Wells55	599774	—	—	—	220,940	3,910,961	—	305	- 305	6	—	—	—	165.0	—	PROD / D	D	—	—	SAYLES, ROGER
B(22-17) 11CDD	Wells55	518158	—	—	—	221,136	3,910,752	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	NEAL, RICHARD,L
B(22-17) 11CDD	Wells55	563479	—	—	—	221,136	3,910,752	—	—	- 400	7	—	—	—	139.0	—	PROD / D	—	—	—	ROBERTSON, DOUGLAS & KAREN
B(22-17) 11DAB	Wells55	500189	—	—	—	221,757	3,911,346	7/17/1981	260	- 260	4	—	—	—	200.0	—	PROD / D	D	—	—	FAWSON,E
B(22-17) 11DCA	Wells55	201441	—	—	—	221,543	3,910,945	—	400	- 400	5	—	—	—	170.0	—	PROD / D	D	—	—	PETHEL, SCOTT & JANNA
B(22-17) 11DCA	Wells55	201997	—	—	—	221,543	3,910,945	2/2/2004	300	- 300	6	—	—	—	125.0	—	PROD / D	D	10	10	LOSSING, VICTOR
B(22-17) 11DCB	Wells55	560470	—	—	—	221,342	3,910,950	3/6/1997	300	- 300	7	—	—	—	150.0	—	PROD / D	D	—	—	STOUGH, CARL & RAELLA
B(22-17) 11DCC	Wells55	208080	—	—	—	221,337	3,910,746	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	SHIPLEY, RAY
B(22-17) 11DCC	Wells55	202914	—	—	—	221,337	3,910,746	—	—	—	—	—	—	—	—	—	PROD / D	D	—	—	SHIPLEY, RAY
B(22-17) 11DCC	Wells55	203727	—	—	—	221,337	3,910,746	—	330	- 21	7	—	—	—	—	—	PROD / D	D	—	—	SHIPLEY, RAY
B(22-17) 11DCC	Wells55	599419	—	—	—	221,337	3,910,746	—	355	- 355	8	—	—	—	266.0	—	PROD / D	D	—	—	MAYBERRY, JON
B(22-17) 11DCC	Wells55	599776	—	—	—	221,337	3,910,746	—	—	- 20	7	—	—	—	—	—	PROD / D	D	—	—	SAYLES, ROGER
B(22-17) 11DDA	Wells55	201440	—	—	—	221,947	3,910,934	2/28/2004	400	- 400	5	—	—	—	230.0	—	PROD / D	D	—	—	REINOSO, ROSS & MARCY
B(22-17) 11DDA	Wells55	599676	—	—	—	221,947	3,910,934	—	—	- 20	—	—	—	—	—	—	PROD / D	D	—	—	SAYLES, ROGER
B(22-17) 11DDB	Wells55	560471	—	—	—	221,745	3,910,940	2/27/1997	300	- 300	7	—	—	—	115.0	—	PROD / D	D	—	—	REINOSO, ROSS & MARCY
B(22-17) 11DDC	Wells55	201032	—	—	—	221,738	3,910,736	—	420	- 420	5	—	—	—	200.0	—	PROD / D	D	—	—	SHORT, BRIAN ALVIS
B(22-17) 11DDD	Wells55	594959	—	—	—	221,941	3,910,731	12/9/2002	309	—	6	—	—	—	—	—	X / D	D	—	—	WILKS, JUSTIN & AMY
B(22-17) 11DDD	Wells55	599677	—	—	—	221,941	3,910,731	1/15/2003	440	- 440	6	—	—	—	160.0	—	PROD / D	D	—	—	SAYLES, ROGER
B(22-17) 11DDD	Wells55	598529	—	—	—	221,941	3,910,731	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WILKS, JUSTIN & AMY
B(22-17) 12DDA	GWSI	625001	—	351818114022201	35-43751	223,634	3,910,914	7/1/1977	990	0 - 920	8	600 - 920	3,581	1/19/2006	579.8	3,001.2	U	D	—	—	CLAUDE NEAL
B(22-17) 12DDA	GWSI	625001	—	351818114022201	35-43751	223,634	3,910,914	7/1/1977	990	0 - 920	8	920 - 980	3,581	1/19/2006	579.8	3,001.2	U	D	—	—	CLAUDE NEAL
B(22-17) 12DDA	Wells55	625001	—	—	—	223,555	3,910,885	7/15/1977	990	- 50	8	—	—	—	405.0	—	PROD / D	—	5	5	NEAL, CLAUDE,
B(22-17) 12DDA	Wells35	—	13717	351818114022201	35-43751	223,555	3,910,885	7/15/1977	990	0 - 990	8	600 - 900	—	—	405.0	—	PROD / D	D	—	—	NEAL , CLAUDE
B(22-17) 13ACB	Wells55	575340	—	—	—	222,922	3,910,096	6/24/1998	245	- 245	4	—	—	—	100.0	—	PROD / D	D	—	—	VAN PELT VI, WILLARD R
B(22-17) 13BAC	Wells55	204864	—	—	—	222,529	3,910,308	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	KRABBE, ERWIN (BUTCH)
B(22-17) 13CDC	Wells55	205219	—	—	—	222,480	3,909,103	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	JONES, JIMMY R
B(22-17) 13DDD	Wells55	592552	—	—	—	223,486	3,909,071	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ARNOLD, GREG
B(22-17) 14AAA	Wells55	595981	—	—	—	221,934	3,910,528	12/17/2002	430	- 430	6	—	—	—	165.0	—	PROD / D	D	—	—	PETERSON, PAUL
B(22-17) 14AAC	Wells55	204574	—	—	—	221,723	3,910,333	—	205	- 205	8	—	—	—	148.0	—	PROD / D	D	—	—	MANION, DUYANNE
B(22-17) 14AAC	Wells55	536469	—	—	—	221,723	3,910,333	9/15/1992	400	- 400	7	—	—	—	135.0	—	PROD / D	D	—	—	SAYLES, WILLIAM,
B(22-17) 14AAD	Wells55	536470	—	—	—	221,925	3,910,328	9/17/1992	300	- 300	7	—	—	—	180.0	—	PROD / D	D	—	—	SAYLES, WILLIAM,
B(22-17) 14ABA	Wells55	207459	—	—	—	221,531	3,910,539	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	SCHICKNER, DANIEL & RENNA
B(22-17) 14ABA	Wells55	592825	—	—	—	221,531	3,910,539	—	705	- 20	9	—	—	—	140.0	—	PROD / D	D	—	—	LEVENDOWSKI, TAD
B(22-17) 14ABA	Wells55	593964	—	—	—	221,531	3,910,539	6/21/2002	300	- 300	6	—	—	—	80.0	—	PROD / D	D	—	—	LEVENDOWSKI, TAD
B(22-17) 14ABA	Wells55	596352	—	—	—	221,531	3,910,539	—	250	- 250	6	—	—	—	167.0	—	PROD / D	D	—	—	BRANSKY, ARLENE
B(22-17) 14ABB	Wells55	598775	—	—	—	221,330	3,910,544	—	290	- 290	5	—	—	—	160.0	—	PROD / D	D	—	—	SAYLES, ROGER
B(22-17) 14ABC	Wells55	536471	—	—	—	221,320	3,910,344	9/7/1992	265	- 265	7	—	—	—	175.0	—	PROD / D	D	—	—	DONENFELD, JOEL A & DIANNE
B(22-17) 14AC	Wells55	506961	—	—	—	221,406	3,910,041	2/20/1984	120	- 120	4	—	—	—	80.0	—	PROD / D	D	—	—	SHUFFLER,J
B(22-17) 14ACA	Wells55	202301	—	—	—	221,512	3,910,138	—	405	- 405	6	—	—	—	70.0	—	PROD / D	D	—	—	MOORE, BARRY D
B(22-17) 14ACC	Wells55	517212	—	—	—	221,299	3,909,945	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	COFFMAN, MERLYN,G
B(22-17) 14ADA	Wells55	206012	—	—	—	221,917	3,910,127	—	250	- 250	5	—	—	—	109.0	—	PROD / D	D	—	—	UNIS, JERRY S

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(22-17) 14ADB	Wells55	201535	—	—	—	221,715	3,910,133	—	—	—	—	—	—	—	—	—	PROD / D	D	—	—	SEIEROE, GARY WAYNE
B(22-17) 14ADB	Wells55	201541	—	—	—	221,715	3,910,133	—	355	- 355	6	—	—	—	—	—	PROD / D	D	—	—	SEIEROE, GARY WAYNE
B(22-17) 14ADB	Wells55	592324	—	—	—	221,715	3,910,133	—	260	- 260	5	—	—	—	110.0	—	PROD / D	D	—	—	GRAHAM, MIKE
B(22-17) 14ADC	Wells55	205000	—	—	—	221,706	3,909,932	—	355	- 355	5	—	—	—	173.0	—	PROD / D	D	—	—	BOCENHAMER, JIMMIE L
B(22-17) 14ADC	Wells55	590916	—	—	—	221,706	3,909,932	—	530	- 525	5	—	—	—	205.0	—	PROD / D	D	—	—	WOOD, KELLY C
B(22-17) 14ADD	Wells55	599242	—	—	—	221,909	3,909,926	6/30/2003	265	- 265	5	—	—	—	120.0	—	PROD / D	D	—	—	FULTON, TOM & JOLENE
B(22-17) 14ADD	Wells55	599291	—	—	—	221,909	3,909,926	—	760	- 760	5	—	—	—	700.0	—	PROD / D	D	—	—	RUOCCHIO, GENE
B(22-17) 14BAB	Wells55	201589	—	—	—	220,928	3,910,554	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	LEWIS TRUST, PATRICIA L
B(22-17) 14BAB	Wells55	207097	—	—	—	220,928	3,910,554	4/8/2005	605	- 600	5	—	—	—	264.0	—	PROD / D	D	—	—	LEWIS TRUST, PATRICIA L
B(22-17) 14BAB	Wells55	209612	—	—	—	220,928	3,910,554	10/27/2005	345	- 345	5	—	—	—	147.0	—	PROD / C	D	—	—	HUALAPAI VALLEY FIRE DEPA
B(22-17) 14BAC	Wells55	200913	—	—	—	220,916	3,910,354	—	—	—	—	—	—	—	—	—	—	—	—	—	HOLDSWORTH, JEFFREY A.
B(22-17) 14BAC	Wells55	201598	—	—	—	220,916	3,910,354	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	LEWIS TRUST, PATRICIA L
B(22-17) 14BAD	Wells55	518157	—	—	—	221,118	3,910,349	12/1/1987	180	- 180	6	—	—	—	107.0	—	PROD / D	D	50	—	NEAL, RICHARD,L
B(22-17) 14BBA	Wells55	207096	—	—	—	220,727	3,910,560	4/9/2005	180	- 180	5	—	—	—	59.0	—	PROD / D	D	—	—	LEWIS TRUST, PATRICIA L
B(22-17) 14BBA	Wells55	590996	—	—	—	220,727	3,910,560	—	385	- 385	5	—	—	—	105.0	—	PROD / D	D	—	—	FULTON, THOMAS % JOLENE
B(22-17) 14BBB	Wells55	518156	—	—	—	220,525	3,910,565	12/10/1987	189	- 187	6	—	—	—	87.0	—	PROD / D	D	—	—	NEAL, RICHARD,L
B(22-17) 14BBD	Wells55	518155	—	—	—	220,714	3,910,360	12/5/1987	240	- 240	6	—	—	—	87.0	—	PROD / D	D	50	—	NEAL, RICHARD,L
B(22-17) 14BCA	Wells55	202627	—	—	—	220,701	3,910,161	4/7/2004	405	- 405	6	—	—	—	128.0	—	PROD / D	D	—	—	LIANGURA, CHARLES
B(22-17) 14BCA	Wells55	522902	—	—	—	220,701	3,910,161	1/25/1989	175	- 175	7	—	—	—	100.0	—	PROD / D	D	—	—	JACKSON, JOSEPH,
B(22-17) 14BCA	Wells55	547426	—	—	—	220,701	3,910,161	—	—	—	—	—	—	—	—	—	PROD / NONE	—	—	—	MALOY, ALICA KAREN,
B(22-17) 14BD	Wells55	085466	—	—	—	220,999	3,910,053	1/1/1980	175	- 175	4	—	—	—	100.0	—	PROD / D	—	—	10	RICCARDI,R
B(22-17) 14BDA	Wells55	509436	—	—	—	221,106	3,910,150	10/16/1984	300	- 300	7	—	—	—	132.0	—	PROD / D	D	—	—	RASMUSSEN,R P
B(22-17) 14BDB	Wells55	534915	—	—	—	220,904	3,910,156	4/28/1982	281	- 281	5	—	—	—	140.0	—	PROD / D	D	22	20	TERLESKY, STEVEN,J
B(22-17) 14BDD	Wells55	556741	—	—	—	221,095	3,909,951	—	223	- 223	4	—	—	—	110.0	—	PROD / D	D	—	—	GRAHAM, BARBARA
B(22-17) 14BDD	Wells55	576436	—	—	—	221,095	3,909,951	8/11/1999	180	- 180	4	—	—	—	70.0	—	PROD / D	D	—	—	PHILLIPS, HAZEL E
B(22-17) 14CAA	Wells55	515888	—	—	—	221,084	3,909,751	2/4/1988	175	- 175	7	—	—	—	100.0	—	PROD / D	D	—	—	MULLEY, TONY,
B(22-17) 14DAA	Wells55	591268	—	—	—	221,900	3,909,726	—	385	- 385	5	—	—	—	120.0	—	PROD / D	D	—	—	DUEY, JACK L
B(22-17) 14DAC	Wells55	560473	—	—	—	221,688	3,909,532	3/15/1997	400	- 20	7	—	—	—	300.0	—	PROD / D	D	—	—	SAYLES, ROGER,
B(22-17) 14DAD	Wells55	563480	—	—	—	221,892	3,909,526	9/14/1997	345	- 345	7	—	—	—	106.0	—	PROD / D	D	—	—	SAYLES, ROGER,
B(22-17) 14DCD	Wells55	590016	—	—	—	221,464	3,909,138	2/23/2002	605	—	7	—	—	—	—	—	PROD / D	D	—	—	BOMAR, LANCE
B(22-17) 14DCD	Wells55	591098	—	—	—	221,464	3,909,138	3/2/2002	305	- 305	5	—	—	—	220.0	—	PROD / D	D	5	4	BOMAR, LANCE
B(22-17) 14DDA	Wells55	592819	—	—	—	221,883	3,909,325	6/24/2002	255	- 250	6	—	—	—	150.0	—	PROD / D	D	—	—	GALL, JOHN & LORI
B(22-17) 14DDD	Wells55	596855	—	—	—	221,875	3,909,124	—	290	- 290	6	—	—	—	151.0	—	PROD / D	D	—	—	SAYLES, ROGER
B(23-14) 03ABB	GWSI	—	—	352435113454001	—	249,975	3,921,765	1/1/1943	75	0 -	16	—	3,403	—	—	—	X / U	G	—	—	—
B(23-14) 03ABB	GWSI	—	—	352435113454001	—	249,975	3,921,765	1/1/1943	75	0 -	16	—	3,403	—	—	—	X / U	D	—	—	—
B(23-14) 03ABB	Wells35	—	13782	—	—	250,007	3,922,098	1/1/1943	75	—	16	—	—	—	—	—	X / K	—	—	—	—
B(23-14) 03ACD	GWSI	—	—	352429113444301	—	250,222	3,921,573	11/1/1943	642	0 - 598	3	498 - 598	3,425	4/24/1965	514.0	2,911.0	T / U	G	—	—	—
B(23-14) 03ACD	GWSI	—	—	352429113444301	—	250,222	3,921,573	11/1/1943	642	0 - 598	3	498 - 598	3,425	4/24/1965	514.0	2,911.0	T / U	D	—	—	—
B(23-14) 03ACD	Wells35	—	13783	—	—	250,191	3,921,489	1/1/1943	642	- 498	3	—	—	—	514.0	—	T / K	—	—	—	—
B(23-14) 03ADC	GWSI	624982	—	352424113443301	—	250,445	3,921,419	11/1/1943	487	0 - 161	16	161 - 491	3,428	1/11/2005	465.8	2,962.2	U	G, D	—	—	—
B(23-14) 03ADC	Wells55	624982	—	—	—	250,392	3,921,484	11/1/1943	515	- 161	16	—	—	—	480.0	—	PROD / D	—	150	150	NEAL, CLAUDE,
B(23-14) 03ADC	Wells35	—	13784	—	—	250,392	3,921,484	1/1/1943	515	- 161	16	—	—	—	454.0	—	T / K	—	—	—	—
B(23-14) 03BBB	GWSI	—	—	352435113453301	—	249,128	3,922,189	1/1/1944	5	0 -	6	—	3,450	—	—	—	X / U	G	—	—	—
B(23-14) 03BBB	Wells35	—	13785	—	—	249,204	3,922,119	1/1/1944	738	—	—	—	—	—	—	—	T / K	G	—	—	—
B(23-14) 03CCA	Wells55	583669	—	—	—	249,371	3,920,903	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	MAY, GARY
B(23-14) 05AAA	Wells55	593232	—	—	—	247,390	3,922,171	8/30/2002	945	—	8	—	—	—	—	—	PROD / D	D	—	—	CHAN-LAN TRUST
B(23-14) 09DBD	Wells55	587720	—	—	—	248,527	3,919,516	11/5/2001	505	- 505	5	—	—	—	435.0	—	PROD / D	D	—	—	REDDICK, LINDA L
B(23-14) 13CCB1	GWSI	627258	—	352217113432001	—	252,684	3,917,434	—	103	—	—	—	3,550	5/23/1932	63.0	3,487.0	U	—	220	220	ATSF
B(23-14) 13CCA	Wells55	627258	—	—	—	252,369	3,917,614	1/1/1926	103	- 80	90	—	—	—	—	—	PROD / MUN	—	—	—	BURLINGTON NORTHERN SANTA
B(23-14) 13CCB	Wells35	—	13786	—	—	252,253	3,917,616	—	103	- 80	90	—	—	—	63.0	—	PROD / I	P	—	220	—
B(23-14) 13CCB2	GWSI	627256	—	352216113432001	—	252,683	3,917,403	1/1/1922	89	0 -	16	60 -	3,550	11/11/1943	51.0	3,499.0	U	—	35	35	ATSF
B(23-14) 13CCA	Wells55	627256	—	—	—	252,369	3,917,614	6/26/1922	89	- 74	16	—	—	—	—	—	PROD / MUN	—	—	—	ATCHISON-TOPEKA,
B(23-14) 13CCB	Wells35	—	13787	—	—	252,253	3,917,616	1/1/1922	89	- 60	16	—	—	—	51.0	—	X / K	P	—	35	—
B(23-14) 13CCB4	GWSI	627257	—	352218113432101	—	252,659	3,917,465	1/1/1925	91	0 -	16	58 -	3,550	6/23/1932	62.0	3,488.0	U	D	25	25	ATSF
B(23-14) 13CCA	Wells55	627257	—	—	—	252,369	3,917,614	12/18/1922	91	- 72	16	—	—	—	—	—	PROD / MUN	—	—	—	ATCHISON-TOPEKA,
B(23-14) 13CCB	Wells35	—	13789	—	—	252,253	3,917,616	1/1/1925	91	- 58	16	—	—	—	62.0	—	PROD / I	D	—	25	—
B(23-14) 13CCB5	GWSI	627255	—	352216113432101	—	252,658	3,917,404	1/2/1900	87	0 -	16	—	3,550	6/23/1932	62.0	3,488.0	U	—	25	25	ATSF
B(23-14) 13CCA	Wells55	627255	—	—	—	252,369	3,917,614	1/2/1900	87	- 92	16	—	—	—	—	—	PROD / MUN	—	—	—	BURLINGTON NORTHERN SANTA
B(23-14) 13CCB	Wells35	—	13790	—	—	252,253	3,917,616	1/2/1900	87	—	16	—	—	—	62.0	—	PROD / I	P	—	25	—
B(23-14) 13CCA	Wells55	575494	—	—	—	252,369	3,917,614	7/19/1999	185	- 182	4	—	—	—	140.0	—	PROD / D	D	—	—	HATHAWAY, CURT & JOANN
B(23-14) 13CCB3	GWSI	—	—	352217113432101	—	252,656	3,917,434	1/1/1919	104	0 -	16	61 -	3,550	11/11/1943	51.0	3,499.0	U	D	85	85	—
B(23-14) 13CCB	Wells35	—	13788	—	—	252,253	3,917,616	1/1/1919	104	- 61	16	—	—	—	51.0	—	X / K	D	—	85	—

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY,
MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(23-14) 13CCC1	GWSI	651079	—	352215113433401	—	252,328	3,917,382	—	80	0 -	48	—	3,585	9/24/1980	—	—	U	—	—	—	GRIGGS
B(23-14) 13CCC1	GWSI	651079	—	352215113433401	—	252,328	3,917,382	—	80	0 -	—	—	3,565	9/24/1980	—	—	U	—	—	—	GRIGGS
B(23-14) 13CCC2	GWSI	—	—	352215113433701	—	252,329	3,917,413	—	75	0 -	72	—	3,586	9/24/1980	—	—	U	D	—	—	GRIGGS
B(23-14) 13CCC3	GWSI	—	—	352214113433301	—	252,353	3,917,350	—	—	0 -	6	—	3,585	—	—	—	PROD / D	—	—	—	GRIGGS
B(23-14) 13CCD	Wells55	642493	—	—	—	252,364	3,917,415	—	125	—	—	—	—	—	—	—	PROD / D	—	—	—	NEAL,E
B(23-14) 13CDA	Wells55	400387	—	—	—	252,599	3,917,610	—	—	—	—	—	—	—	—	—	—	—	—	—	BURLINGTON NORTHERN SANTA
B(23-14) 14DDD	Wells35	—	13791	—	—	252,090	3,917,421	—	80	—	—	—	—	—	52.0	—	PROD / D	P	—	—	—
B(23-14) 14DDD	Wells35	—	13792	—	—	252,090	3,917,421	—	75	—	—	—	—	—	50.0	—	PROD / D	D	—	—	—
B(23-14) 23AAB	Wells55	531288	—	—	—	251,881	3,917,225	4/4/1991	220	- 220	8	—	—	—	21.0	—	PROD / D	D	—	—	TRIPLE G PARTNERSHIP,
B(23-14) 23AAB	Wells55	591218	—	—	—	251,881	3,917,225	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	TRIPLE G PARTNERSHIP
B(23-14) 23DAB	Wells55	551464	—	—	—	251,858	3,916,422	8/31/1995	185	- 185	6	—	—	—	50.0	—	PROD / D	D	—	—	PEACOCK MTN RANCHES
B(23-14) 24BAB1	GWSI	—	—	352206113430401	—	252,578	3,917,282	1/1/1962	290	0 -	8	80 -	3,562	4/21/1980	72.0	3,490.0	U	D	50	50	—
B(23-14) 24BAB1	GWSI	—	—	352206113430401	—	252,578	3,917,282	1/1/1962	290	0 -	20	80 -	3,562	4/21/1980	72.0	3,490.0	U	D	50	50	—
B(23-14) 24AAB	Wells35	—	13793	—	—	252,933	3,917,205	1/1/1962	290	- 80	20	—	—	—	60.0	—	PROD / I	D	—	50	—
B(23-14) 24BAB2	GWSI	—	—	352205113430401	—	252,629	3,917,281	1/1/1962	222	0 -	20	—	3,562	11/10/1995	62.0	3,500.0	U	D	100	100	—
B(23-14) 24AAB	Wells35	—	13794	—	—	252,933	3,917,205	1/1/1962	222	- 90	20	—	—	—	69.0	—	PROD / I	D	—	100	—
B(23-14) 24BBA	Wells55	627222	—	—	—	252,357	3,917,214	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ATCHISON-TOPEKA,
B(23-14) 24BBA	Wells55	627223	—	—	—	252,357	3,917,214	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ATCHISON-TOPEKA,
B(23-14) 24BBB	Wells55	557721	—	—	—	252,242	3,917,216	12/30/1996	280	- 280	7	—	—	—	165.0	—	PROD / D	D	—	—	TRIPLE G PTRSHP,
B(23-14) 25ABB	Wells55	561534	—	—	—	252,854	3,915,598	3/1/1997	286	- 235	6	—	—	—	100.0	—	PROD / D	D	5	2	REID, WALTER F
B(23-14) 25BAA	Wells55	591216	—	—	—	252,539	3,915,601	—	—	—	—	—	—	—	—	—	—	—	—	—	GRIGG, FRED C
B(23-14) 25BAA	Wells55	591217	—	—	—	252,539	3,915,601	—	—	—	—	—	—	—	—	—	—	—	—	—	GRIGG, FRED C
B(23-14) 25BBB	Wells55	576955	—	—	—	252,194	3,915,609	12/23/1999	304	- 304	5	—	—	—	250.0	—	PROD / D	D	—	—	TREMPY, ROY
B(23-14) 25BBC	Wells55	572428	—	—	—	252,188	3,915,406	—	220	- 220	6	—	—	—	145.0	—	PROD / D	D	—	—	MOUSLEY, CHRIS
B(23-14) 25BCB	Wells55	568002	—	—	—	252,182	3,915,203	6/3/1998	280	- 280	6	—	—	—	90.0	—	PROD / D	D	—	—	HOWE, JAY
B(23-14) 25BCB	Wells55	593670	—	—	—	252,182	3,915,203	8/19/2002	230	- 230	5	—	—	—	95.0	—	PROD / D	D	—	—	MELNIK, ALEX
B(23-14) 25CBA	Wells55	202506	—	—	—	252,286	3,914,795	3/5/2004	305	- 305	6	—	—	—	112.0	—	MON / D	D	—	—	MARTIN, BETTY A
B(23-14) 25CBA	Wells55	206424	—	—	—	252,286	3,914,795	—	380	- 376	5	—	—	—	140.0	—	PROD / D	D	—	—	SELF, ROY
B(23-14) 26ABA	Wells55	588734	—	—	—	251,833	3,915,622	6/18/1998	165	- 165	7	—	—	—	57.0	—	PROD / D	D	—	—	SPRING VALLEY RANCHES
B(23-14) 26ACB	GWSI	—	—	352058113434801	—	251,910	3,915,019	—	—	—	—	—	4,200	—	—	—	PROD / S	—	—	—	FRERICHS
B(23-14) 26ADB	Wells55	550462	—	—	—	251,822	3,915,213	6/30/1995	240	- 234	6	—	—	—	100.0	—	PROD / D	D	—	—	PEACOCK MTN RANCHES
B(23-15) 01CBA	Wells55	563091	—	—	—	242,948	3,921,492	6/18/1997	328	- 328	8	—	—	—	244.0	—	PROD / D	D	7	9	NEAL, GRACE,
B(23-15) 01CBC	Wells55	208431	—	—	—	242,739	3,921,296	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ANDERSON, HELENA M
B(23-15) 04DDD	GWSI	624997	—	352400113521401	—	239,309	3,921,014	9/25/1972	805	0 - 580	16	460 - 580	3,175	1/17/2006	462.5	2,712.5	U	D	160	160	CLAUDE NEAL
B(23-15) 04DDD	GWSI	624997	—	352400113521401	—	239,309	3,921,014	9/25/1972	805	570 - 720	14	580 - 715	3,175	1/17/2006	462.5	2,712.5	U	D	160	160	CLAUDE NEAL
B(23-15) 04DDD	GWSI	624997	—	352400113521401	—	239,309	3,921,014	9/25/1972	805	706 - 805	12	706 - 780	3,175	1/17/2006	462.5	2,712.5	U	D	160	160	CLAUDE NEAL
B(23-15) 04DDD	Wells55	624997	—	—	—	239,298	3,920,988	9/25/1972	805	- 805	16	—	—	—	350.0	—	PROD / I	—	240	240	NEAL, CLAUDE,
B(23-15) 04DDD	Wells35	—	13796	—	—	239,298	3,920,988	9/25/1972	805	0 - 805	16	460 - 780	—	—	350.0	—	PROD / D	D	—	160	NEAL , CLAUDE
B(23-15) 07DDA	M&A	208430	—	—	—	236,097	3,919,573	—	—	—	7	—	—	—	—	—	—	—	—	—	—
B(23-15) 07CCC	Wells55	208430	—	—	—	234,651	3,919,512	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ANDERSON, HELENA M
B(23-15) 08CDA	GWSI	624998	—	352320113533501	—	236,779	3,919,665	5/11/1964	600	0 -	16	—	3,085	1/17/2006	371.4	2,713.6	PROD / I	—	1,200	1,200	CLAUDE NEAL
B(23-15) 08DBB	Wells55	624998	—	—	—	237,042	3,920,047	6/11/1964	860	- 600	20	—	—	—	371.0	—	PROD / I	—	1,200	1,200	NEAL, CLAUDE,
B(23-15) 08DBB	Wells35	—	13797	—	—	237,042	3,920,047	—	600	—	20	—	—	—	368.0	—	PROD / I	P	—	1,200	—
B(23-15) 08DDD	GWSI	624999	—	352304113532001	—	237,553	3,919,328	1/1/1964	929	0 -	20	475 -	3,130	1/17/2006	413.3	2,716.7	PROD / MUN	D	1,000	1,000	CLAUDE NEAL
B(23-15) 08DDD	Wells55	624999	—	—	—	237,629	3,919,426	3/17/1964	1,059	- 929	20	—	—	—	400.0	—	PROD / I	—	1,000	1,000	NEAL, CLAUDE,
B(23-15) 08DDD	Wells35	—	13798	—	—	237,629	3,919,426	1/1/1964	929	- 475	20	—	—	—	403.0	—	PROD / MUN	P	—	1,000	—
B(23-15) 13CDA	GWSI	—	—	352215113494001	—	243,098	3,917,949	—	—	—	—	—	3,830	—	—	—	PROD / S	—	—	—	—
B(23-15) 13CDA	Wells55	644876	—	—	—	243,237	3,917,856	1/1/1968	5	—	—	—	—	—	1.0	—	PROD / S	—	20	20	NEAL, CLAUDE,
B(23-15) 13CDA	Wells55	637722	—	—	—	243,237	3,917,856	1/1/1968	5	—	—	—	—	—	1.0	—	PROD / S	—	20	20	NEAL, CLAUDE,
B(23-15) 14CCC	M&A	934496	—	—	PV-A	240,945	3,917,641	4/28/2006	360	—	—	—	—	—	—	—	PROD / MUN	G	—	—	AMERICAN LAND MANAGEMENT, LLC
B(23-15) 24ABB	Wells55	597240	—	—	—	243,422	3,917,447	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BALCIAUSKAS, ARUNAS
B(23-15) 24ACA	Wells55	572745	—	—	—	243,613	3,917,039	3/13/1999	380	- 380	5	—	—	—	—	—	PROD / D	D	15	15	HAUCK, SUSAN
B(23-15) 24BB	Wells35	—	13799	—	—	242,713	3,917,368	9/5/1962	290	0 - 290	11	80 - 210	—	—	—	—	PROD / UNK	D	—	—	SCHOTT , GEORGE
B(23-15) 24BCD	Wells55	584165	—	—	—	242,900	3,916,862	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	MCMAHON, PATRICIA
B(23-15) 24BDB	Wells55	530951	—	—	—	243,007	3,917,057	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BITTNER, TED,
B(23-15) 24DBB	Wells55	585124	—	—	—	243,400	3,916,643	1/24/2001	420	- 420	5	—	—	—	370.0	—	PROD / D	D	—	—	WOJCIECHOWSKI, MIKE
B(23-15) 25ABD	Wells55	573831	—	—	—	243,571	3,915,830	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	TOODLE, BARBARA
B(23-15) 25BBC	GWSI	527164	—	352106113500201	—	242,489	3,915,543	2/2/1991	1,015	0 - 20	7	—	3,790	1/20/2006	959.3	2,830.7	U	D	—	—	TED BITTNER
B(23-15) 25BBC	GWSI	527164	—	352106113500201	—	242,489	3,915,543	6/27/1992	1,015	0 - 1,021	5	960 - 1,021	3,790	1/20/2006	959.3	2,830.7	U	D	—	—	TED BITTNER
B(23-15) 24BDB	Wells55	527164	—	—	—	243,007	3,917,057	6/27/1992	1,021	- 1,021	5	—	—	—	958.0	—	PROD / D	D	—	—	YADAO, ALFONSO
B(23-15) 26DAA	Wells55	518368	—	—	—	242,345	3,915,081	7/16/1987	600	- 20	7	—	—	—	—	—	PROD / D	D	—	—	HIPPLER, EDDY,
B(23-15) 28CDD	GWSI	—	—	352030113525501	—	238,073	3,914,547	1/1/1917	405	0 -	7	40 -	3,270	5/1/1965	489.0	2,781.0	X / U	D	—	—	—
B(23-15) 28CDD	Wells35	—	13800	—	—	238,303	3,914,568	1/1/1917	1,040	- 40	7	—	—	—	489.0	—	X / I	D	—	—	—

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(23-15) 30CBB	M&A	606421	—	—	—	234,476	3,915,355	—	—	—	20	—	—	10/26/2005	376.0	—	—	—	—	—	—
B(23-15) 30CBB	GWSI	606421	—	352052113551801	INDEX BK29, 35-23321	234,477	3,915,347	6/15/1973	1,000	0 - 1,000	20	360 - 990	3,153	1/10/2006	377.2	2,775.8	U	G, D	—	—	—
B(23-15) 30CBB	Wells55	606421	—	—	—	234,528	3,915,278	1/1/1973	1,000	- 1,000	20	—	—	—	—	—	PROD / S	—	50	50	HAFLEY FAMILY LTD,
B(23-15) 30CBB	Wells35	—	13801	352052113551801	35-23321	234,528	3,915,278	6/15/1973	1,000	0 - 1,000	20	360 - 440	—	—	620.0	—	PROD / I	—	—	170	NEAL J
B(23-15) 35AAA	Wells55	559596	—	—	—	242,322	3,914,254	—	—	- 700	7	—	—	—	—	—	PROD / D	—	—	—	AUBERTIN, PATRICIA,
B(23-15) 35BAB	Wells55	583977	—	—	—	241,316	3,914,282	11/21/2000	505	- 20	7	—	—	—	—	—	PROD / D	D	—	—	VERARDE, GLADYS
B(23-15) 36DBA	GWSI	—	—	351952113490901	—	243,525	3,913,434	—	—	—	—	—	3,970	—	—	—	PROD / S	—	—	—	—
B(23-16) 03BBD	Wells55	583006	—	—	—	230,106	3,922,468	9/12/2000	775	- 775	5	—	—	—	650.0	—	PROD / D	D	10	10	PRIETO, RICHARD
B(23-16) 04ACC	Wells55	903091	—	—	—	229,088	3,922,096	—	—	—	—	—	—	—	—	—	D	—	—	—	SCHOLL HOMES INC
B(23-16) 05BBD	Wells55	592651	—	—	—	226,892	3,922,559	—	590	- 590	5	—	—	—	464.0	—	PROD / D	D	—	—	RITLAW, CATHERINE
B(23-16) 05BCB	Wells55	203073	—	—	—	226,688	3,922,363	—	497	- 497	5	—	—	—	316.0	—	PROD / D	D	—	—	GATES, SHELDON M
B(23-16) 05CAC	Wells55	208208	—	—	—	227,070	3,921,749	8/4/2005	665	- 20	9	—	—	—	—	—	PROD / D	—	—	—	S2 MOJAVE LLC
B(23-16) 05CAC	Wells55	208885	—	—	—	227,240	3,921,904	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	S2 MOJAVE LLC
B(23-16) 05CBB	Wells55	902913	—	—	—	226,675	3,921,961	—	—	—	—	—	—	—	—	—	D	—	—	—	CHENEY, PAUL
B(23-16) 05CCB	Wells55	579666	—	—	—	227,464	3,921,538	3/4/2000	520	- 520	5	—	—	—	370.0	—	PROD / D	D	—	—	LINDSEY, DONALD
B(23-16) 05DDC	Wells55	589238	—	—	—	227,858	3,921,326	—	733	- 733	5	—	—	—	416.0	—	PROD / D	D	—	—	MARTIN, GARY & LISA
B(23-16) 06DCA	Wells55	529829	—	—	—	225,761	3,921,586	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	VINCENT, DREW
B(23-16) 07ABB	Wells55	584833	—	—	—	225,426	3,921,192	12/19/2000	655	- 655	5	—	—	—	210.0	—	PROD / D	D	5	5	LYNES, JOHN B
B(23-16) 07ACC	Wells55	800128	—	—	—	225,409	3,920,588	3/13/1978	390	- 391	5	—	—	—	297.0	—	PROD / D	—	4	4	VRIES, J F
B(23-16E) 07BDA	GWSI	805841	—	352339114011801	—	225,548	3,920,751	3/1/1978	430	0 - 24	4	—	3,650	3/12/1980	169.0	3,481.0	PROD / D	—	—	—	STUDER
B(23-16E) 07BDA	GWSI	805841	—	352339114011801	—	225,548	3,920,751	3/1/1978	430	24 - 430	7	40 - 430	3,650	3/12/1980	169.0	3,481.0	PROD / D	—	—	—	STUDER
B(23-16) 07ADD	Wells55	805841	—	—	—	226,372	3,920,559	3/3/1978	430	- 432	6	—	—	—	385.0	—	PROD / D	—	3	—	STUDER, WILLIAM JR,H
B(23-16) 07ADD	Wells35	—	13802	—	35-59647	226,372	3,920,559	3/3/1978	430	- 432	7	—	—	—	270.0	—	PROD / D	D	—	3	Freeman, Dorthy
B(23-16) 07ADD	Wells35	—	13802	—	35-59647	226,372	3,920,559	3/3/1978	430	- 432	7	—	—	—	270.0	—	PROD / D	D	—	3	Studer Jr., William
B(23-16) 07BAA	Wells55	570611	—	—	—	225,105	3,921,202	1/19/1999	560	—	—	—	—	—	—	—	PROD / D	D	—	—	TEETER, JAMES
B(23-16) 07BAA	Wells55	572801	—	—	—	225,105	3,921,202	5/4/1999	760	- 480	6	—	—	—	420.0	—	PROD / D	D	—	—	TEETER, JAMES L
B(23-16) 07BAA	Wells55	572937	—	—	—	225,105	3,921,202	8/16/1999	525	- 518	5	—	—	—	360.0	—	PROD	D	—	—	DOLPH, MATTHEW
B(23-16) 07BAD	Wells55	577183	—	—	—	225,099	3,921,000	8/31/1999	525	- 518	5	—	—	—	345.0	—	PROD / D	D	—	—	DOLPH, MATTHEW
B(23-16) 07CAB	Wells55	208182	—	—	—	224,762	3,920,407	7/15/2005	265	- 265	5	—	—	—	150.0	—	PROD / D	—	—	—	NELSON, BARBARA
B(23-16) 07CAC	Wells55	206142	—	—	—	224,756	3,920,206	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	LLEWELLYN, TED & DOTTIE
B(23-16) 07CDC	Wells55	598971	—	—	—	224,745	3,919,804	7/2/2003	305	- 305	6	—	—	—	220.0	—	PROD / D	D	5	5	NEFF, CARL H
B(23-16) 07DDB	Wells55	591285	—	—	—	226,034	3,919,964	—	630	- 630	5	—	—	—	200.0	—	PROD / D	D	—	—	JACKSON, WALTER & RHONDA
B(23-16) 09BCB	GWSI	632333	—	352340113593301	35-83828	228,208	3,920,757	3/28/1980	710	0 - 710	4	600 - 710	3,358	2/9/2006	504.7	2,853.3	U	D	—	—	FRANK MUELLER
B(23-16) 09AAB	Wells55	632333	—	—	—	229,461	3,921,078	5/1/1980	710	- 710	4	—	—	—	510.0	—	PROD / S	—	5	5	MUELLER,F W
B(23-16) 09AAB	Wells35	—	13803	352340113593301	35-83828	229,461	3,921,078	3/25/1980	710	0 - 710	4	600 - 710	—	—	510.0	—	PROD / D	D	—	10	MAY, DALE
B(23-16) 09BDA	GWSI	641810	—	352338113590301	—	228,954	3,920,617	1/1/1979	625	0 -	6	—	3,325	—	—	—	U	—	—	—	MAY
B(23-16) 09ACB	Wells55	641810	—	—	—	229,047	3,920,887	11/16/1979	625	- 477	6	—	—	—	560.0	—	PROD / S	—	35	35	WILLIAMS, THOMAS R
B(23-16) 09ADA	Wells55	206800	—	—	—	229,651	3,920,670	4/19/2005	670	- 670	5	630 - 670	—	—	501.0	—	PROD / D	D	—	—	SMITH, CATHY R
B(23-16) 09BBB	Wells55	567503	—	—	—	228,253	3,921,113	3/30/1998	825	- 823	8	—	—	—	545.0	—	PROD / D	D	—	—	CAPPELLO, GLENN
B(23-16) 09DAB	Wells55	209797	—	—	—	229,438	3,920,273	11/18/2005	755	- 749	7	709 - 749	—	—	550.0	—	PROD / D	D	—	—	BUTTERFIELD, RONALD
B(23-16) 15BDB	GWSI	—	—	352253113581201	—	230,161	3,919,091	1/1/1965	840	0 -	10	560 -	3,295	1/10/2006	543.3	2,751.7	PROD / S	D	550	550	LEONARD NEAL
B(23-16) 15BDB	GWSI	—	—	352253113581201	—	230,161	3,919,091	1/1/1965	840	0 - 840	—	560 -	3,295	1/10/2006	543.3	2,751.7	PROD / S	D	550	550	LEONARD NEAL
B(23-16) 15BDB	Wells55	606420	—	—	—	230,208	3,919,041	1/1/1965	840	- 840	10	—	—	—	600.0	—	PROD / S	—	600	600	NEAL, GRACE,H
B(23-16) 15BAC	Wells35	—	13804	—	—	230,214	3,919,242	1/1/1965	840	- 560	10	—	—	—	560.0	—	PROD / A	D	—	550	—
B(23-16) 15BCB	Wells35	—	13805	—	—	229,805	3,919,052	1/1/1965	840	0 - 840	10	560 - 840	—	—	280.0	—	PROD / A	D	—	600	NEAL J
B(23-16) 17ACD	GWSI	806780	—	352240113595801	—	227,512	3,918,871	—	—	0 -	12	—	3,453	11/8/1995	76.0	3,376.0	PROD / S	—	—	—	CANYON SPRINGS RANCH
B(23-16) 17ACD	GWSI	806780	—	352240113595801	—	227,512	3,918,871	—	—	0 -	8	—	3,453	11/8/1995	76.0	3,376.0	PROD / S	—	—	—	CANYON SPRINGS RANCH
B(23-16) 17ACC	Wells55	806780	—	—	—	227,389	3,918,921	12/31/1968	—	—	—	—	—	—	—	—	PROD / S	—	—	—	CANYON SPRINGS RANCH, INC
B(23-16) 17BBB	GWSI	530149	—	352300114003301	—	226,647	3,919,515	5/5/1991	400	0 - 20	7	—	3,505	11/8/1991	301.0	3,204.0	PROD / S	D	—	—	DENNIS & EMMA CULP
B(23-16) 17BBB	GWSI	530149	—	352300114003301	—	226,647	3,919,515	5/5/1991	400	0 - 385	6	325 - 385	3,505	11/8/1991	301.0	3,204.0	PROD / S	D	—	—	DENNIS & EMMA CULP
B(23-16) 17BBB	GWSI	530149	—	352300114003301	—	226,647	3,919,515	5/5/1991	400	0 - 385	—	385 - 400	3,505	11/8/1991	301.0	3,204.0	PROD / S	D	—	—	DENNIS & EMMA CULP
B(23-16) 17BBB	Wells55	530149	—	—	—	226,605	3,919,543	5/5/1991	400	- 385	7	—	—	—	305.0	—	PROD / D	D	18	18	CANYON SPRINGS RANCH, INC
B(23-16) 17BBC	Wells55	572049	—	—	—	226,600	3,919,342	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BOLKS, DONALD J
B(23-16) 18BAA	Wells55	207483	—	—	—	225,059	3,919,592	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	GOODBLOOD, ROY E
B(23-16) 18BAA	Wells55	573016	—	—	—	225,059	3,919,592	—	920	- 773	7	—	—	—	340.0	—	PROD / D	D	—	—	FRANCOIS, THERESE O
B(23-16) 18BAD	Wells55	474143	—	—	—	225,054	3,919,391	—	—	—	—	—	—	—	—	—	—	—	—	—	DOLPH, MATTHEW
B(23-16) 18BAD	Wells55	544164	—	—	—	225,054	3,919,391	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	DOLPH, MATTHEW,
B(23-16) 18BAD	Wells55	570612	—	—	—	225,054	3,919,391	3/8/1999	920	- 765	5	—	—	—	100.0	—	PROD	D	—	—	DOLPH, MATTHEW
B(23-16) 18BAD	Wells55	574143	—	—	—	225,054	3,919,391	5/24/1999	880	- 770	5	—	—	—	95.0	—	PROD / D	D	—	—	DOLPH, MATTHEW
B(23-16) 18BAD	Wells55	903129	—	—	—	225,054	3,919,391	—	—	—	—	—	—	—	—	—	D	—	—	—	PETERS, GEROLD
B(23-16) 18BDA	Wells55	204481	—	—	—	225,049	3,919,191	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	VILLAR, ANGEL
B(23-16) 18DAB	Wells55	570807	—	—	—	226,005	3,918,760	10/24/1998	503	- 503	5	—	—	—	300.0	—	PROD / D	D	7	7	GOODBLOOD, ROBERT C
B(23-16) 18DAB	Wells55	586888	—	—	—	226,005	3,918,760	10/10/2001	430	- 430	5	—	—	—	380.0	—	PROD / D	D	—	—	VALDEZ, NICOLAS
B(23-16) 18DAC	Wells55	579217	—	—	—	226,001	3,918,560	2/9/2000	585	- 580	5	—	—	—	340.0	—	PROD / D	D	—	—	LIVINGSTON, GREGORY
B(23-16) 18DBA	Wells55	576537	—	—	—	225,683	3,918,770	2/15/1999	505	- 505	5	—	—	—	445.0	—	PROD / D	D	—	—	LIVINGSTON, GREGORY

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(23-16) 18DDA	Wells55	208212	—	—	—	226,370	3,918,679	—	—	—	—	—	—	—	—	—	—	—	—	—	—
B(23-16) 19BDC	Wells55	572016	—	—	—	224,672	3,917,394	5/27/1999	1,000	- 20	7	—	—	—	378.0	—	PROD / D	D	—	—	TEETER, JAMES L
B(23-16) 19BDC	Wells55	578502	—	—	—	224,672	3,917,394	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	TEETER, JAMES L
B(23-16) 19CAC	Wells55	208684	—	—	—	224,660	3,916,992	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	TRUDO, GREGORY A
B(23-16) 19CCB	Wells55	536655	—	—	—	224,013	3,916,814	9/21/1992	425	- 425	7	—	—	—	230.0	—	PROD / D	D	3	1	BALDWIN, JOHN H & JULIE
B(23-16) 19CCB	Wells55	589934	—	—	—	224,013	3,916,814	12/13/2001	705	- 705	5	—	—	—	315.0	—	PROD / D	D	—	—	BALDWIN, JOHN H & JULIE
B(23-16) 19CCC	Wells55	551158	—	—	—	224,007	3,916,613	8/11/1995	300	- 300	7	—	—	—	240.0	—	PROD / D	D	—	—	CARLEY, JUDITH A
B(23-16) 19CDA	Wells55	603041	—	—	—	224,873	3,916,780	10/1/1979	325	- 325	4	—	—	—	225.0	—	PROD / I	—	5	5	GRANT, J R
B(23-16) 19DDD	Wells55	541211	—	—	—	226,247	3,916,531	2/23/1994	680	- 680	5	—	—	—	350.0	—	PROD / D	D	18	22	CUARZO WELL & WATER,
B(23-16) 19DDD	Wells55	542790	—	—	—	226,247	3,916,531	9/5/1994	860	- 860	5	—	—	—	200.0	—	PROD / D	D	7	7	CHARCAS WELL&WATER,
B(23-16) 19DDD	Wells55	550303	—	—	—	226,247	3,916,531	8/21/1995	1,006	- 1,006	5	—	—	—	394.0	—	PROD / D	D	24	24	CHARCAS WELL & WATER
B(23-16) 21AAC	Wells55	550633	—	—	—	229,358	3,917,657	9/3/1995	700	- 700	7	—	—	—	580.0	—	PROD / D	D	—	—	GEE, GAYLA R
B(23-16) 21BDB	Wells55	208288	—	—	—	228,549	3,917,478	7/25/2005	425	- 425	5	—	—	—	220.0	—	PROD / D	—	—	—	HULL, GARY & JANETTE
B(23-16) 30ABB	Wells55	200897	—	—	—	225,280	3,916,364	—	20	- 20	7	—	—	—	400.0	—	PROD / D	D	—	—	KENDRICK, EDWARD R
B(23-16) 30ABB	Wells55	200898	—	—	—	225,280	3,916,364	—	330	- 330	6	—	—	—	—	—	PROD / D	D	—	—	HEASLIP, BILL
B(23-16) 30ABB	Wells55	591283	—	—	—	225,280	3,916,364	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	HEASLIP, BILL
B(23-16) 30ADC	Wells55	563483	—	—	—	225,903	3,915,740	—	—	- 900	7	—	—	—	700.0	—	PROD / D	—	—	—	OLMOS, JOSEPH,
B(23-16) 30BBA	Wells55	208198	—	—	—	224,321	3,916,400	—	455	- 20	7	—	—	—	—	—	PROD / D	—	—	—	PAGE, DEAN H
B(23-16) 30CDC	Wells55	587498	—	—	—	224,600	3,914,981	11/20/2001	955	- 925	5	—	—	—	906.0	—	PROD / D	D	—	—	MASTERSON, JACK & GINNY
B(23-16) 31DBD	Wells55	564803	—	—	—	225,523	3,913,741	—	930	- 20	7	—	—	—	—	—	PROD / D	D	—	—	WILLIAMS, SCOTT
B(23-16) 31DCD	Wells55	204641	—	—	—	225,511	3,913,338	—	805	- 20	7	—	—	—	—	—	PROD / D	D	—	—	CALHOUN, MARVIN H
B(23-16) 31DCD	Wells55	204762	—	—	—	225,511	3,913,338	—	20	- 20	7	—	—	—	—	—	PROD / D	D	—	—	CALHOUN, MARVIN H
B(23-16) 33CCC	Wells55	535555	—	—	—	228,024	3,913,264	1/1/1993	611	- 511	8	—	—	—	—	—	PROD / D	D	—	—	LONGORIA, JON,G
B(23-16) 35BAC	Wells55	503426	—	—	—	231,684	3,914,360	7/10/1982	115	- 115	6	—	—	—	30.0	—	PROD / D	D	15	15	MORGAN,M
B(23-16) 35BCB	Wells55	501159	—	—	—	231,277	3,914,171	—	800	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L.-FAMILY,
B(23-16) 36BCC	Wells55	200151	—	—	—	232,978	3,913,919	12/22/2003	465	- 465	5	—	—	—	410.0	—	MON	D	—	—	CITY OF KINGMAN
B(23-17) 24DDD	Wells35	—	13813	—	35-70658	223,762	3,917,127	1/1/1960	160	0 -	6	—	—	—	—	—	PROD / A	D	—	—	JORDAN FAMILY TRUST
B(23-17) 25ACA	Wells55	201436	—	—	—	223,339	3,916,536	—	600	- 600	5	—	—	—	395.0	—	PROD / D	D	—	—	EATON, LINDA FAITH
B(23-17) 25ACB	Wells55	588542	—	—	—	223,137	3,916,543	7/15/1998	600	—	—	—	—	—	—	—	X / NONE	D	—	—	REED, RUBY L
B(23-17) 25ACB	Wells55	570128	—	—	—	223,137	3,916,543	10/10/1998	625	- 625	5	—	—	—	500.0	—	PROD / D	D	—	—	REED, RUBY L
B(23-17) 25BDC	Wells55	576278	—	—	—	222,728	3,916,355	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	JEFFERSON, PAUL F
B(23-17) 25BDC	Wells55	583064	—	—	—	222,728	3,916,355	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	JEFFERSON, PAUL F
B(23-17) 25DAB	Wells55	536508	—	—	—	223,528	3,916,128	4/8/1993	585	- 585	7	—	—	—	510.0	—	PROD / D	D	—	—	WILKS, STEVE,
B(23-17) 25DBC	Wells55	586849	—	—	—	223,119	3,915,940	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	TRIMBLE, RON
B(23-17) 25DBC	Wells55	599420	—	—	—	223,119	3,915,940	—	630	- 630	6	—	—	—	—	—	PROD / D	D	—	—	HOLZ, HOWARD
B(23-17) 25DC	Wells55	085394	—	—	—	223,211	3,915,635	1/1/1980	500	—	—	—	—	—	450.0	—	X / D	—	—	2	NEAL, JOHN,L
B(23-17) 25DDB	Wells55	526294	—	—	—	223,516	3,915,726	11/5/1989	130	- 130	5	—	—	—	54.0	—	PROD / D	D	—	—	FREEMAN, PAUL,
B(23-17) 35A	Wells55	202615	—	—	—	221,783	3,915,083	—	—	- 20	—	—	—	—	—	—	PROD / D	D	—	—	SCHALL, ROBERT A
B(23-17) 35AAA	Wells55	590917	—	—	—	222,084	3,915,371	4/24/2002	700	- 700	5	—	—	—	345.0	—	PROD / D	D	—	—	MOODY, FRANK
B(23-17) 35ADB	Wells55	903914	—	—	—	221,879	3,914,980	—	—	—	—	—	—	—	—	—	D	—	—	—	SCHALL, ROBERT
B(23-17) 35DBA	Wells55	567494	—	—	—	221,866	3,914,590	5/6/1998	458	- 458	5	—	—	—	145.0	—	PROD / D	D	—	—	LANE, STUART AND DIAN
B(23-17) 35DCD	Wells55	556615	—	—	—	221,547	3,913,994	10/23/1997	160	- 160	6	—	—	—	—	—	PROD / D	D	10	6	CONNOR, JOHN,
B(23-17) 35DDB	Wells55	526901	—	—	—	221,854	3,914,187	7/30/1990	305	- 305	7	—	—	—	70.0	—	PROD / D	D	3	3	MUNRO, STUART
B(23-17) 35DDC	Wells55	530979	—	—	—	221,848	3,913,986	2/27/1991	300	- 300	7	—	—	—	80.0	—	PROD / D	D	7	7	MILLERMAN, HARVEY,J
B(23-17) 35DDC	Wells55	581534	—	—	—	221,848	3,913,986	7/3/2000	229	- 229	5	—	—	—	133.0	—	PROD / D	D	—	—	COURSON, RODNEY AND JUDI
B(23-17) 35DDD	Wells55	206002	—	—	—	222,048	3,913,979	—	297	- 297	5	—	—	—	260.0	—	PROD / D	D	—	—	WAIT, LORETTA
B(23-17) 35DDD	Wells55	597575	—	—	—	222,048	3,913,979	8/30/1984	175	- 175	7	—	—	—	60.0	—	PROD / D	D	2	2	PARKER,E M
B(23-17) 36ACC	Wells55	506454	—	—	—	223,079	3,914,736	11/23/1983	370	—	—	—	—	—	—	—	X / D	D	—	—	MILLERMAN, HARVEY,J
B(23-17) 36BBC	Wells55	592357	—	—	—	222,289	3,915,164	—	555	- 555	6	—	—	—	140.0	—	PROD / D	D	—	—	ANDERSON, MATTHIAS
B(23-17) 36BCC	Wells55	535053	—	—	—	222,276	3,914,766	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	KILE, CHESTER,
B(23-17) 36BCD	Wells55	543130	—	—	—	222,477	3,914,759	5/22/1997	288	- 36	6	—	—	—	164.0	—	PROD / D	D	10	10	KILE, CHESTER,
B(23-17) 36BCD	Wells55	590894	—	—	—	222,477	3,914,759	3/10/2002	650	- 35	7	—	—	—	164.0	—	PROD / D	D	—	—	KILE, CHESTER
B(23-17) 36BDC	Wells55	902451	—	—	—	222,678	3,914,751	—	—	—	—	—	—	—	—	—	D	—	—	—	ARIAS, LUIS
B(23-17) 36CAD	Wells55	204047	—	—	—	222,865	3,914,344	—	545	- 545	6	—	—	—	364.0	—	PROD / D	D	—	—	MOFFITT & OSBORN PARTNERS
B(23-17) 36CAD	Wells55	204048	—	—	—	222,865	3,914,344	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	MOFFITT & OSBORN PARTNERS
B(23-17) 36CBC	Wells55	543768	—	—	—	222,263	3,914,369	6/30/1994	340	- 340	7	—	—	—	240.0	—	PROD / D	D	5	5	FRENCH, JENNIFER,M
B(23-17) 36CCC	Wells55	500292	—	—	—	222,250	3,913,971	7/15/1981	400	- 400	4	—	—	—	320.0	—	PROD / D	D	1	1	SCHIPPERS,S
B(23-17) 36CCC	Wells55	903888	—	—	—	222,250	3,913,971	—	—	—	—	—	—	—	—	—	D	—	—	—	HOPKINS, NATHAN
B(23-17) 36DAA	Wells55	087698	—	—	—	223,676	3,914,513	—	300	—	—	—	—	—	—	—	PROD / D	—	—	—	LOSSING,B E
B(23-17) 36DBD	Wells55	087699	—	—	—	223,266	3,914,328	1/1/1981	535	- 20	6	—	—	—	—	—	PROD / D	—	—	—	EATON,E T
B(23-17) 36DCA	Wells55	087700	—	—	—	223,260	3,914,128	—	300	—	—	—	—	—	—	—	PROD / D	—	—	—	HARRISON,J R
B(23-17) 36DCB	Wells55	208365	—	—	—	223,059	3,914,136	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	UNTEREIN, KARL
B(24-14) 05DDD	GWSI	807424	—	352917113464101	—	247,695	3,930,390	—	577	—	—	—	3,259	2/10/2006	456.8	2,802.2	PROD / D	—	—	—	JOHN S DANIELS
B(24-14) 05DDD	Wells55	807424	—	—	—	247,620	3,930,438	6/12/1978	900	- 200	6	—	—	—	247.0	—	PROD / D	—	55	—	DANIELS, JOHN,S

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(24-14) 09CBB	GWSI	536971	—	352843113465001	—	247,749	3,929,417	12/15/1992	950	—	7	740 - 940	3,281	1/11/2006	525.1	2,755.9	U	D	—	—	RON PEYTON
B(24-14) 09CBB	GWSI	536971	—	352843113465001	—	247,749	3,929,417	12/15/1992	950	- 940	6	740 - 940	3,281	1/11/2006	525.1	2,755.9	U	D	—	—	RON PEYTON
B(24-14) 09CBB	Wells55	536971	—	—	—	247,794	3,929,413	12/15/1992	950	- 940	5	—	—	—	650.0	—	PROD / D	D	—	—	GORHAM, GALE,M
B(24-14) 09CBB	Wells55	532791	—	—	—	247,794	3,929,413	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	PEYTON, RON,
B(24-14) 19ABD	GWSI	535306	—	352713113481301	—	245,546	3,926,763	7/15/1992	1,020	0 -	7	800 - 1,020	3,260	11/9/1995	755.0	2,505.0	PROD / S	D	—	—	ROGER LANG
B(24-14) 19ABD	GWSI	535306	—	352713113481301	—	245,546	3,926,763	7/15/1992	1,020	0 - 1,020	5	800 - 1,020	3,260	11/9/1995	755.0	2,505.0	PROD / S	D	—	—	ROGER LANG
B(24-14) 19ABD	Wells55	535306	—	—	—	245,509	3,926,851	7/15/1992	1,020	- 1,020	5	—	—	—	750.0	—	PROD / D	D	7	4	LANG, ROGER,D
B(24-14) 21CCC	Wells55	538274	—	—	—	247,689	3,925,591	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	LANCASTER, TOM,
B(24-14) 27ABD	Wells55	210763	—	—	—	250,292	3,925,113	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	SANDOVAL, RALPH E
B(24-14) 27ABD	Wells55	210747	—	—	—	250,292	3,925,113	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	JAMES L TEETER, TRUSTEE U
B(24-14) 27ADC	Wells55	596350	—	—	—	250,482	3,924,706	—	780	- 20	7	—	—	—	351.0	—	PROD / D	D	—	—	CHAN-LAN TRUST
B(24-14) 27DDA	Wells55	577248	—	—	—	250,657	3,924,097	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	CHAN-LAN TRUST ET AL
B(24-14) 28CAD	GWSI	624981	—	352555113462001	INDEX BK28	248,365	3,924,394	1/1/1943	705	0 -	16	524 -	3,353	1/11/2006	548.1	2,804.9	U	G, D	—	—	—
B(24-14) 28DBB	Wells55	624981	—	—	—	248,456	3,924,561	10/15/1943	705	- 705	16	—	—	—	542.0	—	PROD / MUN	—	550	550	NEAL, CLAUDE,
B(24-14) 28DBC	Wells35	—	13851	—	—	248,461	3,924,360	1/1/1943	741	- 524	16	—	—	—	497.0	—	PROD / MUN	—	—	—	—
B(24-14) 29AAA	GWSI	—	—	352629113464701	—	247,450	3,925,352	7/1/1944	700	0 - 674	16	600 - 662	3,318	10/30/1995	—	—	U	D	—	—	—
B(24-14) 29AAA	GWSI	—	—	352629113464701	—	247,450	3,925,352	7/1/1944	700	0 - 674	16	674 - 700	3,318	10/30/1995	—	—	U	D	—	—	—
B(24-14) 29AAA	Wells35	—	13852	—	—	247,480	3,925,395	1/1/1944	700	- 600	16	—	—	—	599.0	—	T / K	—	—	—	—
B(24-14) 29AAB	Wells55	209348	—	—	—	247,278	3,925,401	2/15/2006	—	—	—	800 - 900	—	—	—	—	PROD / D	—	—	—	BAYLE, DAVID
B(24-14) 29ABA	GWSI	541961	—	352632113470801	—	247,140	3,925,453	1/17/1994	963	0 - 20	9	0 -	3,312	1/11/2006	676.5	2,635.5	U	D	—	—	ROGER LANG
B(24-14) 29ABA	GWSI	541961	—	352632113470801	—	247,140	3,925,453	1/17/1994	963	0 - 955	4	695 - 735	3,312	1/11/2006	676.5	2,635.5	U	D	—	—	ROGER LANG
B(24-14) 29ABA	GWSI	541961	—	352632113470801	—	247,140	3,925,453	1/17/1994	963	0 - 955	4	835 - 935	3,312	1/11/2006	676.5	2,635.5	U	D	—	—	ROGER LANG
B(24-14) 29ABA	GWSI	541961	—	352632113470801	—	247,140	3,925,453	1/17/1994	963	0 - 955	4	955 - 963	3,312	1/11/2006	676.5	2,635.5	U	D	—	—	ROGER LANG
B(24-14) 29ABA	Wells55	541961	—	—	—	247,077	3,925,406	1/17/1994	963	- 955	6	—	—	—	670.0	—	PROD / D	D	—	—	LANG, ROGER,
B(24-14) 29ACB	GWSI	—	—	352811113471401	—	246,887	3,925,090	3/1/1944	949	0 -	3	—	3,325	1/7/1991	581.0	2,744.0	U	G, D	—	—	—
B(24-14) 29ACB	Wells35	—	13853	—	—	246,866	3,925,009	1/1/1944	949	—	5	—	—	—	625.0	—	X / K	—	—	—	—
B(24-14) 29BBA	Wells55	550011	—	—	—	246,272	3,925,428	7/13/1995	935	- 950	7	—	—	—	860.0	—	PROD / D	D	—	7	KIDD, THOMAS,
B(24-14) 29BDA	Wells55	535744	—	—	—	246,664	3,925,014	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ADCOCK, ORAN,K
B(24-14) 33ADA	GWSI	—	—	352518113454001	—	249,093	3,923,366	1/1/1944	623	0 -	16	—	3,375	1/11/2006	552.0	2,823.0	U	D	430	430	—
B(24-14) 33ADA	Wells35	—	13854	—	—	249,037	3,923,336	1/1/1944	766	—	16	—	—	—	514.0	—	T / K	D	—	430	—
B(24-14) 33CCC	Wells55	535749	—	—	—	247,598	3,922,367	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WHITE, JAMES,A
B(24-15) 01BAC	GWSI	—	—	352951113493901	—	243,517	3,931,691	—	—	—	—	—	3,132	1/11/2006	621.3	2,510.7	—	—	—	—	—
B(24-15) 01BBD	GWSI	551149	—	352850113494801	—	243,289	3,931,689	—	417	—	7	—	3,129	1/16/1996	—	—	X / U	—	—	—	BETTY AND WAYNE GREENE
B(24-15) 01BBD	Wells55	551149	—	—	—	243,235	3,931,909	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	GREENE, BETTY,
B(24-15) 01BBD	Wells55	557865	—	—	—	243,235	3,931,909	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	GREENE, WAYNE,
B(24-15) 01BCC	Wells55	575024	—	—	—	243,021	3,931,467	8/31/1999	900	- 900	5	—	—	—	625.0	—	PROD / D	D	6	4	GREENE, WAYNE B
B(24-15) 05BBC	Wells55	575396	—	—	—	236,587	3,932,113	9/29/1999	806	- 806	5	—	—	—	472.0	—	PROD / D	D	—	—	THE NORTHWEST TRUST
B(24-15) 05CBD	Wells55	593374	—	—	—	236,761	3,931,198	11/10/1997	602	- 602	7	480 - 602	—	—	480.0	—	PROD / D	D	—	—	DEHOS, CHARLOTTE A
B(24-15) 05DAC	Wells55	578340	—	—	—	237,765	3,931,166	3/7/2000	715	- 715	6	—	—	—	675.0	—	PROD / D	D	—	—	HAMM, HUGH R
B(24-15) 05DBC	Wells55	583721	—	—	—	237,364	3,931,178	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WIESE, RICHARD
B(24-15) 11AAA	GWSI	—	—	352901113503501	—	242,825	3,930,418	1/1/1963	492	—	—	—	3,135	3/19/1980	—	—	U	—	—	—	—
B(24-15) 11AAA	Wells35	—	13855	—	—	242,789	3,930,364	1/1/1963	550	- 109	24	—	—	—	—	—	X / K	P	—	—	—
B(24-15) 11ABC	GWSI	—	—	352900113503001	—	241,802	3,917,222	—	—	—	—	—	3,130	1/18/2006	600.1	2,529.9	—	—	—	—	—
B(24-15) 11BAA	Wells55	593595	—	—	—	241,980	3,930,388	9/12/2002	771	- 771	5	—	—	—	618.0	—	PROD / D	D	—	—	DAVIS, FULLER & LEAH
B(24-15) 11BCA	Wells55	593660	—	—	—	241,686	3,929,987	10/9/2002	755	- 755	6	—	—	—	555.0	—	PROD / D	D	10	10	SEAMAN, HAROLD
B(24-15) 11CBB	Wells55	202992	—	—	—	241,353	3,929,600	9/8/2004	670	- 6,670	6	650 - 670	—	—	570.0	—	PROD / D	D	—	—	DOAN, KAREN LEE
B(24-15) 12DAC	Wells55	205043	—	—	—	244,172	3,928,319	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WOOD, GLENN & SHARON
B(24-15) 13AAC	Wells55	584914	—	—	—	244,149	3,928,512	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	CASAS, CHRIS J
B(24-15) 13ADA	Wells55	205174	—	—	—	244,345	3,928,305	3/12/2005	980	- 950	6	910 - 950	—	—	708.0	—	PROD / D	D	—	—	HURLEY, GERALD & JANETT
B(24-15) 13DBD	Wells55	202061	—	—	—	243,926	3,927,713	—	891	- 891	5	—	—	—	684.0	—	PROD / D	D	—	—	CLARK, JOHN
B(24-15) 13DDC	GWSI	—	—	352727113481201	—	244,076	3,927,233	—	—	—	—	—	3,255	1/11/2006	726.9	2,528.1	—	—	—	—	—
B(24-15) 18BBB	M&A	525378	—	—	—	234,899	3,929,024	—	447	0 - 222	9	—	—	—	—	—	—	—	—	—	—
B(24-15) 18BBB	GWSI	525378	—	352818113551901	NEAL EXPL BOREHOLE #2	234,896	3,929,021	10/5/1989	2,300	0 - 215	9	215 - 2,300	2,958	1/12/2006	—	—	U	G, R	—	—	HAFLEY FAMILY PARTNERSHIP
B(24-15) 18BBB	Wells55	525378	—	—	—	234,837	3,928,970	10/5/1989	2,300	- 215	9	—	—	—	425.0	—	PROD / I	D	—	—	HAFLEY FAMILY LTD,
B(24-15) 19DBB	Wells55	501158	—	—	—	235,642	3,926,533	—	900	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L.-FAMILY,
B(24-15) 21CCC	Wells55	586538	—	—	—	238,020	3,925,857	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	VAN NURDEN, HARVEY K
B(24-15) 25CAB	Wells55	210779	—	—	—	243,238	3,924,710	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	TAYLOR, WENDY J
B(24-15) 25DDD	Wells55	577582	—	—	—	244,229	3,924,076	12/17/1999	865	- 865	5	—	—	—	765.0	—	PROD / D	D	—	—	WARNER, HARRY G
B(24-15) 26CCD	Wells55	202735	—	—	—	241,408	3,924,158	5/12/2004	820	- 820	6	—	—	—	577.0	—	PROD / D	D	7	9	HERZOG, THOMAS & ELIZAB
B(24-15) 26CDC	Wells55	558080	—	—	—	241,610	3,924,152	—	—	—	—	—	—	—	—	—	PROD / D	—	20	20	SUMINSKI, PATRICK,
B(24-15) 26CDC	Wells55	574628	—	—	—	241,610	3,924,152	6/21/1999	800	- 800	4	—	—	—	700.0	—	PROD / D	D	—	—	SUMINSKI, MARILYN
B(24-15) 27ADB	Wells55	589019	—	—	—	240,828	3,925,181	11/13/2001	740	- 730	6	—	—	—	705.0	—	PROD / D	D	7	10	—
B(24-15) 27BCC	Wells55	593541	—	—	—	239,617	3,925,012	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	SEAMAN, PHYLLIS ANDERSO
B(24-15) 27BDD	Wells55	592705	—	—	—	240,221	3,924,996	—	905	- 20	9	—	—	—	—	—	PROD / D	D	—	—	SEAMAN, PHYLLIS ANDERSO
B(24-15) 27BDD	Wells55	594194	—	—	—	240,221	3,924,996	8/21/2002	720	- 720	6	—	—	—	580.0	—	PROD / D	D	10	10	SEAMAN, HAROLD

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY,
MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(24-15) 27CCC	Wells55	549068	—	—	—	239,596	3,924,205	4/20/1995	650	- 650	7	—	—	—	580.0	—	PROD / D	D	—	—	HUNT, CAROL
B(24-15) 27DBD	Wells55	571338	—	—	—	240,613	3,924,583	12/15/1998	690	- 690	7	—	—	—	620.0	—	PROD / D	D	—	—	—
B(24-15) 27DBD	Wells55	591914	—	—	—	240,613	3,924,583	—	735	- 735	5	—	—	—	640.0	—	PROD / D	D	—	—	HUNTER, TALIA
B(24-15) 27DDC	Wells55	568239	—	—	—	240,804	3,924,174	6/12/1998	790	- 790	7	—	—	—	680.0	—	PROD / D	D	—	—	MCCOY, RUSSELL D AND T
B(24-15) 27DDD	GWSI	—	—	352548113511401	—	240,896	3,924,259	—	—	—	—	—	3,159	1/17/2006	644.2	2,514.8	—	—	—	—	—
B(24-15) 28CAC	GWSI	—	—	352557113525501	—	238,354	3,924,619	—	—	—	—	—	3,023	1/17/2006	513.2	2,509.8	—	—	—	—	—
B(24-15) 28CAC	Wells55	577910	—	—	—	238,392	3,924,639	11/4/1999	728	- 728	6	—	—	—	640.0	—	PROD / D	D	—	—	MACK, JAMES W
B(24-15) 28CCA	Wells55	595990	—	—	—	238,184	3,924,442	1/5/2004	620	- 620	5	500 - 620	—	—	520.0	—	PROD / D	D	—	—	JARRETT, CHASE
B(24-15) 28DAA	Wells55	595287	—	—	—	239,410	3,924,816	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	NEWMAN, MARK & CATHERIN
B(24-15) 28DDD	GWSI	—	—	352542113521101	—	239,469	3,924,146	—	—	—	—	—	3,075	1/17/2006	564.1	2,510.9	—	—	—	—	—
B(24-15) 28DDD	Wells55	205640	—	—	—	239,394	3,924,211	4/5/2005	713	- 697	7	—	—	—	550.0	—	PROD / D	D	—	—	GREGERSON, DAVID J
B(24-15) 31AAA	M&A	201885	—	—	—	236,241	3,924,184	—	—	—	7	—	—	—	—	—	—	—	—	—	—
B(24-15) 31AAA	Wells55	201885	—	—	—	236,150	3,924,101	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	HAFLEY, TY J
B(24-15) 31ABC	Wells55	200530	—	—	—	235,560	3,923,918	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	HAFLEY, TY J
B(24-15) 32ABD	GWSI	604196	—	352528113533201	35-27713	237,433	3,923,767	10/4/1974	850	0 - 600	20	440 - 600	3,019	1/17/2006	507.7	2,511.3	U	D	—	—	WF CATTLE CO
B(24-15) 32ABD	GWSI	604196	—	352528113533201	35-27713	237,433	3,923,767	10/4/1974	850	580 - 850	16	580 - 810	3,019	1/17/2006	507.7	2,511.3	U	D	—	—	WF CATTLE CO
B(24-15) 32ACA	Wells55	604196	—	—	—	237,348	3,923,662	10/4/1974	690	- 690	8	—	—	—	520.0	—	PROD / I	—	—	—	WF CATTLE CO INC.
B(24-15) 32ACA	Wells35	—	13856	352528113533201	35-27713	237,348	3,923,662	10/4/1974	850	0 - 580	20	440 - 810	—	—	515.0	—	PROD / I	D	—	—	WF CATTLE CO
B(24-15) 32BCA	GWSI	604195	—	352527113540401	35-27272	236,599	3,923,752	4/19/1974	677	0 - 677	10	537 - 637	3,020	—	—	—	U	D	—	—	WF CATTLE CO
B(24-15) 32BBD	Wells55	604195	—	—	—	236,545	3,923,887	9/1/1974	850	- 850	18	—	—	—	520.0	—	PROD / I	—	—	—	WF CATTLE CO INC.
B(24-15) 32BBD	Wells35	—	13857	352527113540401	35-27272	236,545	3,923,887	4/9/1974	677	—	10	537 - 637	—	—	510.0	—	PROD / I	D	—	—	WF CATTLE CO
B(24-15) 33BBB	M&A	624990	—	—	—	237,912	3,924,087	—	—	—	16	—	—	—	—	—	—	—	—	—	—
B(24-15) 33BBB	GWSI	624990	—	352540113531301	—	237,884	3,924,093	2/1/1973	1,100	0 - 1,100	16	530 - 1,090	3,020	1/17/2006	506.6	2,513.4	U	D	—	—	CLAUDE NEAL
B(24-15) 33BBB	Wells55	624990	—	—	—	237,968	3,924,044	2/2/1973	1,100	- 1,100	16	—	—	—	515.0	—	PROD / D	—	4,000	4,000	NEAL, CLAUDE,
B(24-15) 33BBB	Wells35	—	13858	—	—	237,968	3,924,044	2/2/1973	1,100	0 - 1,100	16	530 - 1,090	—	—	565.0	—	PROD / D	D	—	—	NEAL , CLAUDE
B(24-15) 35BCB	Wells55	203625	—	—	—	241,190	3,923,559	—	813	- 813	6	—	—	—	650.0	—	PROD / D	D	—	—	MILLER, PATRICIA
B(24-15) 35CBC	GWSI	548429	—	352503113510501	—	241,086	3,922,893	3/28/1995	800	- 20	7	—	3,208	1/17/2006	681.0	2,517.0	PROD / D	D	—	—	DEL NEWMAN
B(24-15) 35CBC	GWSI	548429	—	352503113510501	—	241,086	3,922,893	3/28/1995	800	- 800	4	730 - 800	3,208	1/17/2006	691.0	2,517.0	PROD / D	D	—	—	DEL NEWMAN
B(24-15) 35BCC	Wells55	548428	—	—	—	241,184	3,923,958	3/28/1995	800	- 800	7	—	—	—	730.0	—	PROD / D	D	18	25	NEWMAN, DEL,
B(24-16) 01DDD	M&A	619553	—	—	—	234,868	3,930,704	—	—	—	18	—	—	—	—	—	—	—	—	—	—
B(24-16) 01DDD1	GWSI	619553	—	352910113553001	INDEX BK28	234,868	3,930,706	1/1/1963	700	0 -	20	—	2,961	1/12/2006	449.7	2,511.3	PROD / I	—	800	800	ENNIS VAUGHN
B(24-16) 01	Wells55	619553	—	—	—	234,108	3,931,620	1/1/1963	700	- 700	20	—	—	—	454.0	—	PROD / D	—	3,000	3,000	VAUGHAN,E
B(24-16) 01DDD	M&A	506419	—	—	—	234,819	3,930,706	—	—	—	7	—	—	—	—	—	—	—	—	—	—
B(24-16) 01DDD2	GWSI	506419	—	352912113552301	—	234,811	3,930,745	10/31/1983	540	0 - 22	7	—	2,958	—	—	—	PROD / D	D	—	—	ENNIS VAUGHN
B(24-16) 01DDD2	GWSI	506419	—	352912113552301	—	234,811	3,930,745	10/31/1983	540	0 - 455	5	455 - 540	2,958	—	—	—	PROD / D	D	—	—	ENNIS VAUGHN
B(24-16) 01DCC	Wells55	506419	—	—	—	234,184	3,930,822	10/31/1983	540	- 455	7	—	—	—	454.0	—	PROD / D	D	3	3	VAUGHAN,E
B(24-16) 06AAA	Wells55	206844	—	—	—	228,721	3,932,634	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BRITT, MICHAEL
B(24-16) 07BBC	Wells55	210241	—	—	—	224,422	3,930,695	1/18/2006	720	- 664	5	—	—	—	500.0	—	PROD / D	D	—	—	MCBRAYER MORTGAGE SERVICE
B(24-16) 07CAA	Wells55	210240	—	—	—	225,384	3,930,062	1/12/2006	645	- 622	5	—	—	—	540.0	—	PROD / D	D	—	—	MCBRAYER MORTGAGE SERVICE
B(24-16) 07CDA	Wells55	210242	—	—	—	225,352	3,929,860	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	MCBRAYER FAMILY TRUST
B(24-16) 07DBD	Wells55	206507	—	—	—	225,997	3,929,842	3/3/2005	805	- 775	5	—	—	—	500.0	—	PROD / D	D	—	—	MASON, JAMES R
B(24-16) 08ACA	Wells55	204068	—	—	—	227,920	3,930,395	7/22/2004	605	- 605	6	565 - 605	—	—	358.0	—	PROD / D	D	—	—	SAMMONS, PAT
B(24-16) 08BDB	Wells55	206736	—	—	—	227,317	3,930,409	3/18/2005	613	- 602	7	—	—	—	458.0	—	PROD / D	D	—	—	WEIDE, LUCINA M
B(24-16) 08DCA	Wells55	203356	—	—	—	227,898	3,929,590	5/10/2004	605	- 605	6	565 - 605	—	—	468.0	—	PROD / D	D	—	—	JONES, ESTON D
B(24-16) 10AAA	Wells55	523211	—	—	—	231,558	3,930,693	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L. - FAMILY,
B(24-16) 10AAA	M&A	—	—	352909113573101	—	231,566	3,930,739	—	—	—	9	—	—	10/26/2005	406.0	—	—	—	—	—	—
B(24-16) 10AAA1	GWSI	—	—	352909113573101	—	231,557	3,930,780	9/24/1989	2,220	0 - 209	9	209 - 2,220	2,917	—	—	—	U	G, P, R	—	—	—
B(24-16) 10AAA	M&A	525360	—	—	—	231,568	3,930,769	—	—	—	16	—	—	10/26/2005	406.0	—	—	—	—	—	—
B(24-16) 10AAA2	GWSI	525360	—	352910113573101	—	231,568	3,930,801	10/11/1989	1,111	0 - 1,111	16	385 - 585	2,917	1/12/2006	405.9	2,511.1	U	D	—	—	NEAL FAMILY PARTNERS
B(24-16) 10AAA2	GWSI	525360	—	352910113573101	—	231,568	3,930,801	10/11/1989	1,111	0 - 1,111	16	950 - 990	2,917	1/12/2006	405.9	2,511.1	U	D	—	—	NEAL FAMILY PARTNERS
B(24-16) 10AAA	Wells55	525360	—	—	—	231,558	3,930,693	2/11/1989	1,111	—	16	400 - 1,111	—	—	400.0	—	PROD / I	D	—	3,000	NEAL, J.L.-FAMILY,
B(24-16) 10CAA	GWSI	525381	—	352840113580701	—	230,605	3,929,821	11/2/1989	1,111	0 - 1,111	16	400 - 440	2,918	1/12/2006	409.3	2,508.7	PROD / S	D	—	—	NEAL FAMILY PARTNERS
B(24-16) 10CAA	GWSI	525381	—	352840113580701	—	230,605	3,929,821	11/2/1989	1,111	0 - 1,111	16	480 - 520	2,918	1/12/2006	409.3	2,508.7	PROD / S	D	—	—	NEAL FAMILY PARTNERS
B(24-16) 10CAA	GWSI	525381	—	352840113580701	—	230,605	3,929,821	11/2/1989	1,111	0 - 1,111	16	1,070 - 1,090	2,918	1/12/2006	409.3	2,508.7	PROD / S	D	—	—	NEAL FAMILY PARTNERS
B(24-16) 10CAA	Wells55	525381	—	—	—	230,730	3,929,910	11/2/1989	1,111	—	16	—	—	—	400.0	—	PROD / I	D	—	3,300	NEAL, J.L.-FAMILY,
B(24-16) 10CAC	Wells55	523212	—	—	—	230,522	3,929,715	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L. - FAMILY,
B(24-16) 11DDC	M&A	606423	—	—	—	233,043	3,929,193	—	—	—	20	—	—	10/26/2005	429.0	—	—	—	—	—	—
B(24-16) 11DDD	GWSI	606423	—	352818113563401	—	233,044	3,929,196	1/1/1974	798	0 -	16	460 -	2,938	1/12/2006	429.5	2,508.5	U	D	—	—	LEONARD NEAL
B(24-16) 11DDD	Wells55	606423	—	—	—	233,124	3,929,231	1/6/1975	798	- 798	20	—	—	—	434.0	—	PROD / S	—	3,700	3,700	HAFLEY, LEONARD,E
B(24-16) 11DDD	Wells35	—	13859	—	35-28465	233,124	3,929,231	1/6/1975	798	0 - 798	20	433 - 788	—	—	365.0	—	PROD / I	D	—	—	NEAL , J
B(24-16) 15ACC	Wells55	087581	—	—	—	230,868	3,928,494	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, JOHN,L
B(24-16) 17CCC	Wells55	086817	—	—	—	226,837	3,927,805	1/1/1981	520	—	—	—	—	—	—	—	X / D	—	—	—	BOZZO ANITA
B(24-16) 17DAD	Wells55	559008	—	—	—	228,259	3,928,170	7/8/1997	500	- 20	7	—	—	—	—	—	PROD / D	D	—	—	BROCKMEYER, MICHAEL,E
B(24-16) 19	Wells55	593205	—	—	—	225,429	3,926,938	—	—	—	—	—	—	—	—	—	—	—	—	—	BROWN, ALBERT EUGENE
B(24-16) 19ACC	Wells55	202311	—	—	—	225,593	3,927,034	—	420	- 420	6	—	—	—	286.0	—	PROD / D	D	—	—	PAULSGROVE, RONNY

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY,
MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(24-16E) 19AAC	GWSI	503136	—	352717114005201	—	226,451	3,927,463	6/11/1983	600	0 - 146	6	—	3,145	2/9/2006	519.3	2,625.7	PROD / D	D	—	—	AL KAELIN
B(24-16E) 19AAC	GWSI	503136	—	352717114005201	—	226,451	3,927,463	6/11/1983	600	40 - 600	5	560 - 600	3,145	2/9/2006	519.3	2,625.7	PROD / D	D	—	—	AL KAELIN
B(24-16E) 19AAC	GWSI	503136	—	352717114005201	—	226,451	3,927,463	6/11/1983	600	0 - 146	6	—	3,145	2/9/2006	519.3	2,625.7	PROD / D	D	—	—	CALLEEN RITCHIE
B(24-16E) 19AAC	GWSI	503136	—	352717114005201	—	226,451	3,927,463	6/11/1983	600	40 - 600	5	560 - 600	3,145	2/9/2006	519.3	2,625.7	PROD / D	D	—	—	CALLEEN RITCHIE
B(24-16) 19ADC	Wells55	503136	—	—	—	226,230	3,927,017	6/11/1983	600	- 600	6	—	—	—	480.0	—	PROD / I	D	4	4	KAELIN,A
B(24-16) 19BCA	Wells55	549705	—	—	—	224,643	3,927,262	6/13/1995	450	- 450	7	—	—	—	370.0	—	PROD / D	D	—	—	LOSSING, BERNARD,
B(24-16) 19BDC	Wells55	587596	—	—	—	224,958	3,927,052	7/13/2001	455	- 445	5	—	—	—	390.0	—	PROD / D	D	—	—	ERWIN, WAYNE
B(24-16) 19CAA	Wells55	202201	—	—	—	225,268	3,926,841	—	355	- 355	6	—	—	—	255.0	—	PROD / D	D	—	—	KENYON, GREGORY
B(24-16) 19CAA	Wells55	593207	—	—	—	225,268	3,926,841	11/4/2002	264	- 264	5	—	—	—	139.0	—	PROD / D	D	—	—	SERNA, ARTHUR AND KATH
B(24-16) 19CAB	Wells55	593208	—	—	—	224,950	3,926,850	—	180	- 180	6	—	—	—	120.0	—	PROD / D	D	—	—	BROWN, ALBERT EUGENE
B(24-16) 19CAB	Wells55	593209	—	—	—	224,950	3,926,850	9/26/2002	284	- 264	5	—	—	—	145.0	—	PROD / D	D	—	—	LINGENFELTER INVESTMENTS
B(24-16) 19CAC	Wells55	593210	—	—	—	224,944	3,926,648	5/21/2003	455	- 455	6	—	—	—	150.0	—	PROD / D	D	—	—	GIDDENS AND WEBBER
B(24-16) 19CAD	Wells55	593206	—	—	—	225,262	3,926,640	10/31/2002	264	- 264	5	—	—	—	130.0	—	PROD / D	D	15	33	ALLEN, DAVID
B(24-16) 19DAD	Wells55	549197	—	—	—	226,536	3,926,606	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WARD, RICHARD,M
B(24-16) 19DBD	Wells55	585939	—	—	—	225,899	3,926,823	3/22/2001	695	- 570	5	—	—	—	660.0	—	PROD / D	D	8	8	WEIDNER, JOHN A
B(24-16) 21BAD	GWSI	507197	—	352716113590701	—	229,056	3,927,339	4/10/1984	900	0 - 850	6	490 - 850	3,032	—	—	—	PROD / D	D	—	—	BERTLES
B(24-16) 21BAD	GWSI	507197	—	352716113590701	—	229,056	3,927,339	4/10/1984	900	0 - 850	6	850 - 900	3,032	—	—	—	PROD / D	D	—	—	BERTLES
B(24-16) 21BBD	Wells55	507197	—	—	—	228,538	3,927,349	4/10/1984	900	- 850	9	—	—	—	535.0	—	PROD / D	D	7	7	ROBERT JELLISON, TERI BOWMAN &
B(24-16) 26ABA	GWSI	—	—	352624113564601	—	232,619	3,925,822	—	—	—	—	—	3,026	1/19/2006	513.7	2,512.3	—	—	—	—	—
B(24-16) 26ABA	Wells55	585614	—	—	—	232,619	3,925,822	3/15/2001	705	- 690	6	—	—	—	660.0	—	PROD / D	D	—	—	BENSUSAN, GUY
B(24-16) 26CBC	Wells55	595998	—	—	—	231,584	3,924,844	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	GARCIA, ISRAEL D.C.
B(24-16) 26CDB	Wells55	593532	—	—	—	231,981	3,924,631	8/7/2002	690	- 690	7	650 - 690	—	—	558.0	—	PROD / D	D	—	—	WILBUR, JAMES & BONNIE
B(24-16) 34AAC	Wells55	208369	—	—	—	231,157	3,924,052	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BOGART, RITA
B(24-16) 34BAA	GWSI	—	—	352534113575201	—	230,864	3,924,150	—	—	—	—	—	3,103	1/18/2006	539.8	2,563.2	—	—	—	—	—
B(24-16) 34BDA	Wells55	593958	—	—	—	230,550	3,923,868	8/10/2002	813	- 800	7	—	—	—	599.0	—	PROD / D	D	5	56	MENARD, RANDY AND ARLEN
B(24-16) 34CAD	Wells55	590625	—	—	—	230,531	3,923,264	1/29/2003	812	- 812	5	—	—	—	635.0	—	PROD / D	D	10	—	MAGISTRO, NANCY
B(24-16) 34CAD	Wells55	596763	—	—	—	230,531	3,923,264	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	MAGISTRO, NANCY
B(24-16) 34DDB	Wells55	585904	—	—	—	231,125	3,923,047	9/1/2001	935	- 935	5	—	—	—	613.0	—	PROD / D	D	—	—	FANGHELLA, JOHN
B(24-17) 03DAD	Wells55	087578	—	—	—	220,978	3,932,019	—	—	—	—	—	—	—	—	—	PROD / S	—	—	—	NEAL, JOHN,L
B(24-17) 03DBB	Wells55	523214	—	—	—	220,382	3,932,205	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, JOHN,L
B(24-17) 08ADA	Wells55	523215	—	—	—	217,743	3,931,203	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, JOHN,L
B(24-17) 08ADA	Wells55	209632	—	—	—	217,743	3,931,203	—	605	- 140	7	—	—	—	40.0	—	PROD / D	D	—	—	NEAL, JOHN T
B(24-17) 10AAC	Wells55	523213	—	—	—	220,758	3,931,309	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, JOHN,L
B(24-17) 10BCD	Wells55	533556	—	—	—	219,744	3,930,941	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	NEAL, JOHN,L
B(24-17) 11ADD	Wells55	087580	—	—	—	222,554	3,930,853	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, JOHN,L
B(24-17) 11CBC	Wells55	563832	—	—	—	221,136	3,930,491	—	380	- 380	4	—	—	—	257.0	—	PROD / D	D	—	—	NEAL, JOHN T
B(25-14) 19CBA	Wells55	575094	—	—	—	243,771	3,936,161	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	CRAWFORD, EDWARD
B(25-15) 13AAB	Wells55	590811	—	—	—	243,236	3,938,591	—	505	- 20	7	—	—	—	380.0	—	PROD / D	D	—	—	LYTLE, DOUGLAS
B(25-15) 25CAC	Wells55	560466	—	—	—	242,311	3,934,391	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	OVERSON, GARY & LINDA
B(25-15) 29CCC	GWSI	606907	—	353103113550201	—	235,431	3,934,122	—	—	—	—	—	2,942	1/18/2006	434.2	2,507.8	U	—	—	—	—
B(25-15) 29CCC	Wells55	606907	—	—	—	235,453	3,934,192	—	—	—	—	—	—	—	—	—	—	—	—	—	MAYLAND PROPERTIES,
B(25-16) 23CCC	GWSI	508148	—	353154113581601	—	230,609	3,935,877	6/4/1985	500	0 - 450	7	320 - 450	2,867	1/18/2006	362.1	2,504.9	PROD / S	D	—	—	JOHN L NEAL
B(25-16) 23CCC	GWSI	508148	—	353154113581601	—	230,609	3,935,877	6/4/1985	500	0 - 450	7	450 - 500	2,867	1/18/2006	362.1	2,504.9	PROD / S	D	—	—	JOHN L NEAL
B(25-16) 23BBB	Wells55	508148	—	—	—	230,719	3,937,357	6/4/1985	500	- 500	7	—	—	—	385.0	—	PROD / S	D	340	340	NEAL, JOHN,L
B(25-16) 23DDA	Wells55	087577	—	—	—	232,989	3,936,113	—	—	—	—	—	—	—	—	—	PROD / S	—	—	—	NEAL, JOHN,L
B(25-16) 30CDA	GWSI	—	—	353105114021001	—	224,804	3,934,672	10/11/1961	600	0 - 460	10	440 - 460	2,945	1/18/2006	434.4	2,510.6	PROD / S	D	—	—	—
B(25-16) 30CDA	GWSI	—	—	353105114021001	—	224,804	3,934,672	10/11/1961	600	480 - 600	8	460 - 557	2,945	1/18/2006	434.4	2,510.6	PROD / S	D	—	—	—
B(25-16) 30CDA	Wells35	—	13877	—	—	224,792	3,934,727	1/1/1961	600	- 440	10	—	—	—	438.0	—	PROD / A	D	—	—	—
B(25-16) 31ACB	Wells55	593273	—	—	—	224,958	3,933,913	7/12/2002	610	- 530	7	—	—	—	425.0	—	PROD / D	D	—	—	MATUSZAK, JOYCE
B(25-16) 33CDD	Wells55	087576	—	—	—	227,962	3,932,813	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, JOHN,L
B(25-16) 33DAA	Wells55	087579	—	—	—	228,784	3,933,395	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, JOHN,L
B(25-16) 33DCC	Wells55	504223	—	—	—	228,184	3,932,808	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, JOHN,L
B(25-17) 03AAA	Wells55	504219	—	—	—	220,997	3,942,518	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L.-FAMILY,
B(25-17) 03DDD	Wells55	504220	—	—	—	220,957	3,941,107	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L.-FAMILY,
B(25-17) 13AAA	GWSI	519151	—	353338114023401	—	224,194	3,939,250	10/17/1987	400	0 - 400	9	320 - 380	2,798	2/9/2006	292.0	2,506.0	PROD / D	D	—	—	FLOYD LITREAL
B(25-17) 13AAA	Wells55	519151	—	—	—	224,123	3,939,190	10/17/1987	400	- 400	8	—	—	—	295.0	—	PROD / D	D	22	2	SSCHOTT, RICHARD & GLORI
B(25-17) 17AAA	Wells55	600501	—	—	—	217,675	3,939,389	—	300	—	—	—	—	—	—	—	NONE / S	—	—	—	AGUILA STORAGE AND TRANSP
B(25-17) 23BCA	Wells55	560677	—	—	—	221,244	3,937,256	1/16/1997	483	- 467	4	—	—	—	400.0	—	PROD / D	D	—	—	D'AMBRO, JR. JOHN,V
B(25-17) 23BCB	GWSI	—	—	353227114043601	—	221,045	3,937,188	—	—	—	—	—	2,804	2/9/2006	401.0	2,403.0	—	—	—	—	—
B(25-17) 23BDD	Wells55	586830	—	—	—	221,642	3,937,042	5/12/2001	636	- 586	6	—	—	—	480.0	—	PROD / D	D	—	—	AMBRO JR, JOHN V
B(26-15) 23CDB	Wells35	—	13896	—	—	241,034	3,945,512	12/1/1967	180	0 - 180	10	80 - 180	—	—	60.0	—	PROD / A	D	—	20	NEAL , J
B(26-16) 06AAA	Wells55	534946	—	—	—	228,118	3,952,021	5/23/1992	—	—	8	—	—	—	—	—	MIN / NONE	D	—	—	HALITE PROCESSING CO,
B(26-16) 16AA	Wells55	526081	—	—	Tran Am RL-1, O&G # P-867	229,138	3,948,603	10/9/1989	—	—	—	—	—	—	—	—	MIN / NONE	D	—	—	LUSK, OLIVER,
B(26-16) 19CCC	Wells35	—	13902	—	35-84694	224,522	3,945,832	—	600	—	—	—	—	—	—	—	T / K	P	—	—	CARSON WATER CO

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY,
MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(26-16) 26C	GWSI	—	—	353628114580401	El Paso RL-1, O&G # P-542	231,156	3,944,303	7/11/1970	—	0 - 39	12	—	2,835	—	—	—	T / U	P	—	—	EL PASO NATURAL GAS CO
B(26-16) 26C	GWSI	—	—	353628114580401	El Paso RL-1, O&G # P-543	231,156	3,944,303	7/11/1970	—	0 - 1,692	7	—	2,835	—	—	—	T / U	P	—	—	EL PASO NATURAL GAS CO
B(26-16) 26C	GWSI	—	—	353628114580401	El Paso RL-1, O&G # P-544	231,156	3,944,303	7/11/1970	—	0 - 5,968	2	—	2,835	—	—	—	T / U	P	—	—	EL PASO NATURAL GAS CO
B(26-16) 28DDC	GWSI	—	—	353617113593201	Kerr McGee RL-2, O&G # NP 08-02	228,932	3,944,031	1/1/1958	2,135	0 -	4	—	2,814	—	—	—	PROD /	D	—	—	KERR MCGEE
B(26-16) 29BBB	GWSI	600494	—	353705114012801	CER-1, 35-82801	226,118	3,945,580	—	650	0 -	16	—	2,778	1/12/2006	281.0	2,497.0	U	P	—	—	CARSON WATER CO
B(26-16) 29BBB	Wells55	600494	—	—	—	226,109	3,945,583	12/5/1979	655	- 654	16	—	—	—	280.0	—	PROD / MIN	—	220	220	AGUILA STORAGE AND TRANSP
B(26-16) 29BBB	Wells35	—	13903	353705114012801	35-82802	226,109	3,945,583	12/5/1979	655	0 - 654	16	310 - 654	—	—	284.0	—	PROD / K	D	—	—	CARSON WATER CO
B(26-16) 29DDD	GWSI	600496	—	353618114002701	35-83083, CER-2	227,501	3,944,109	—	710	0 -	16	—	2,804	1/12/2006	308.4	2,495.6	U	—	—	—	CARSON WATER CO
B(26-16) 29DDD	Wells55	600496	—	—	—	227,474	3,944,133	12/11/1979	710	- 710	16	—	—	—	306.0	—	PROD / MIN	—	200	200	AGUILA STORAGE AND TRANSP
B(26-16) 29DDD	Wells35	—	13904	353618114002701	35-83083	227,474	3,944,133	12/11/1979	710	0 - 710	16	369 - 710	—	—	—	—	PROD / MIN	D	—	—	CARSON WATER CO
B(26-16) 30DDD	GWSI	—	—	353616114013001	Kerr McGee RL-1, O&G # NP-08-03	225,937	3,944,123	1/1/1958	2,608	0 -	4	—	2,768	—	—	—	PROD /	—	—	—	KERR MCGEE
B(26-17) 03AAA	Wells55	523216	—	—	—	221,301	3,952,176	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L. - FAMILY,
B(26-17) 19DDB	Wells35	—	13906	—	—	216,088	3,946,296	1/1/1971	185	0 - 185	8	60 - 180	—	—	140.0	—	PROD / D	D	—	35	NEAL , J
B(26-17) 19DDD	Wells55	600503	—	—	—	216,282	3,946,088	—	200	—	—	—	—	—	—	—	PROD / S	—	—	—	AGUILA STORAGE AND TRANSP
B(26-17) 23CBB	M&A	085945	—	—	—	221,238	3,946,547	—	—	0 - 6	7	—	—	—	—	—	—	—	—	—	—
B(26-17) 23CBB1	GWSI	085945	—	353732114044001	—	221,226	3,946,552	10/20/1980	600	0 - 5	9	—	2,759	6/17/2003	—	—	U	P	—	—	CARSON WATER CO
B(26-17) 23CBB1	GWSI	085945	—	353732114044001	—	221,226	3,946,552	10/20/1980	600	0 -	1	—	2,759	6/17/2003	—	—	U	P	—	—	CARSON WATER CO
B(26-17) 23BBC	Wells55	085945	—	—	CER-X3	221,347	3,947,137	1/1/1980	600	—	—	—	—	—	—	—	PROD / K	D	—	—	AGUILA STORAGE AND TRANSP
B(26-17) 23CBB	Wells55	600497	—	—	CER-X3	221,322	3,946,535	10/1/1980	600	—	6	—	—	—	—	—	X / K	—	—	—	CARSON WATER CO,
B(26-17) 23CBB	M&A	086254	—	—	—	221,247	3,946,512	—	645	0 - 645	14	339 - 645	—	12/17/2005	257.0	—	—	—	—	—	—
B(26-17) 23CBB2	GWSI	086254	—	353731114043801	—	221,250	3,946,521	6/12/1981	650	0 - 650	14	—	2,759	6/17/2003	—	—	U	D	—	—	CARSON WATER CO
B(26-17) 23CBB	Wells55	086254	—	—	CER-4	221,322	3,946,535	6/12/1981	650	- 600	14	—	—	—	258.0	—	U / MIN	—	1,800	1,800	DESERT COMMUNITIES, INC.
B(26-17) 23CBB	Wells55	600491	—	—	CER-4	221,322	3,946,535	6/12/1981	650	- 650	14	—	—	—	263.0	—	PROD / MIN	—	1,800	1,800	CARSON WATER CO,
B(26-17) 23CCC1	GWSI	600495	—	353708114042101	BIG WELL	221,707	3,945,828	1/1/1957	700	0 -	14	272 -	2,762	3/25/1980	262.0	2,500.0	PROD / S	D	2,200	2,200	CARSON WATER CO
B(26-17) 23CCC	Wells55	600495	—	—	Neal-1	221,298	3,945,932	10/5/1957	719	- 719	14	—	—	—	263.0	—	PROD / MIN	—	1,500	1,500	AGUILA STORAGE AND TRANSP
B(26-17) 23CCC	Wells35	—	13908	—	—	221,298	3,945,932	10/5/1957	719	191 - 719	14	0 - 400	—	—	250.0	—	PROD / I	D	—	2,200	NEAL , J
B(26-17) 23CCC	Wells35	—	13907	—	—	221,298	3,945,932	1/1/1959	700	0 - 700	14	272 - 428	—	—	272.0	—	PROD / A	D	—	2,200	NEAL , J
B(26-17) 23CCC2	GWSI	085478	—	353709114044001	—	221,230	3,945,874	8/25/1980	600	0 - 10	6	—	2,762	11/8/1995	262.0	2,500.0	U	P	—	—	CARSON WATER CO
B(26-17) 23CCC2	GWSI	085478	—	353709114044001	—	221,230	3,945,874	8/25/1980	600	0 -	2	—	2,762	11/8/1995	282.0	2,500.0	U	D	—	—	CARSON WATER CO
B(26-17) 23CCC	Wells55	085478	—	—	—	221,298	3,945,932	8/25/1980	600	—	—	—	—	—	375.0	—	MON	D	—	—	AGUILA STORAGE AND TRANSP
B(26-17) 23CCC	Wells55	600499	—	—	—	221,298	3,945,932	—	600	—	6	—	—	—	—	—	X / K	—	—	—	CARSON WATER CO,
B(26-17) 23CCC	Wells35	—	13909	—	35-84692	221,298	3,945,932	—	600	—	—	—	—	—	—	—	PROD / MIN	P	—	—	CARSON WATER CO
B(26-17) 23CDD	M&A	086253	—	—	RL-1	221,972	3,945,841	—	739	0 - 739	14	255 - 739	—	10/25/2005	257.0	—	—	—	—	1,050	—
B(26-17) 23CDD	GWSI	086253	—	353709114041001	—	221,969	3,945,838	2/2/1981	750	0 - 750	14	—	2,758	1/12/2006	258.2	2,501.8	U	D	—	—	CARSON WATER CO,
B(26-17) 23CDD	Wells55	086253	—	—	CER-3	221,902	3,945,914	2/2/1981	750	- 750	14	—	—	—	258.0	—	U / MIN	D	1,500	1,500	DESERT COMMUNITIES, INC.
B(26-17) 23CDD	Wells55	600493	—	—	CER-3	221,902	3,945,914	—	750	- 750	14	—	—	—	258.0	—	PROD / MIN	—	1,500	1,500	CARSON WATER CO,
B(26-17) 23DDD	Wells55	086252	—	—	—	222,706	3,945,690	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	CARSON WATER CO,
B(26-17) 23DDD	Wells55	600492	—	—	—	222,706	3,945,690	—	700	—	14	—	—	—	—	—	PROD / MIN	—	1,500	1,500	CARSON WATER CO,
B(26-17) 25BBB	GWSI	084693	—	353705114033601	—	222,835	3,945,638	6/30/1980	258	0 - 3	6	3 - 258	2,757	12/4/1985	—	—	U	P, D	—	—	CARSON WATER CO
B(26-17) 25BBB	Wells55	084693	—	—	—	222,901	3,945,681	6/30/1980	600	—	—	—	—	—	375.0	—	T / UTIL	D	—	—	AGUILA STORAGE AND TRANSP
B(26-17) 25BBB	Wells55	600498	—	—	—	222,901	3,945,681	—	600	—	6	—	—	—	380.0	—	X / K	—	—	—	CARSON WATER CO,
B(26-17) 26DD	Wells55	642276	—	—	—	222,558	3,944,385	—	750	—	—	—	—	—	250.0	—	PROD / S	—	1,500	1,500	BLM-PHOENIX DISTRICT,
B(26-17) 27ABA	Wells55	504221	—	—	—	220,686	3,945,749	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L.-FAMILY,
B(26-17) 27ACA	GWSI	—	—	353650114044101	—	220,763	3,945,456	1/1/1956	613	—	—	—	2,782	6/17/2003	—	—	U	D	—	—	CARSON WATER CO
B(26-17) 27ACA	GWSI	—	—	353650114044101	—	220,763	3,945,456	1/1/1956	613	—	—	—	2,782	6/17/2003	—	—	U	D	—	—	LEONARD NEAL
B(26-17) 27ACA	Wells35	—	13910	—	—	220,676	3,945,347	10/1/1956	613	0 - 613	6	—	—	—	500.0	—	PROD / I	D	—	—	NEAL , J
B(26-17) 27DDD	Wells55	504222	—	—	—	221,050	3,944,326	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	NEAL, J.L.-FAMILY,
B(26-17) 35AAA	M&A	600500	—	—	—	222,705	3,944,082	—	699	0 - 699	14	405 - 699	—	10/25/2005	265.0	—	—	—	—	—	—
B(26-17) 35AAA	GWSI	600500	—	353610114033501	—	222,705	3,944,081	1/1/1957	800	0 -	16	—	2,768	1/12/2006	264.5	2,503.5	PROD / S	D	1,500	1,500	CARSON WATER CO
B(26-17) 35AAA	GWSI	600500	—	353610114033501	—	222,705	3,944,081	1/1/1957	800	0 -	16	—	2,768	1/12/2006	264.5	2,503.5	PROD / S	D	1,500	1,500	LEONARD NEAL
B(26-17) 35AAA	Wells55	600500	—	—	Neal-2	222,649	3,944,080	6/1/1957	800	- 700	14	—	—	—	274.0	—	PROD / S	—	500	500	AGUILA STORAGE AND TRANSP
B(26-17) 35AAA	Wells35	—	13911	—	—	222,649	3,944,080	1/1/1957	800	—	16	—	—	—	266.0	—	X / K	D	—	1,500	—
B(26-17) 35AAA	Wells35	—	13912	—	—	222,649	3,944,080	6/1/1957	700	0 - 700	20	400 - 700	—	—	600.0	—	PROD / UNK	D	—	—	NEAL , J
B(26-17) 35AAA	Wells35	—	13913	—	35-84691	222,649	3,944,080	—	600	—	—	—	—	—	—	—	PROD / MIN	P	—	—	CARSON WATER CO
B(26-18) 01ACA	Wells55	542198	—	—	—	214,452	3,951,998	2/21/1994	780	- 780	7	—	—	—	580.0	—	PROD / D	D	—	—	MAYLES, MARGARET,
B(26-18) 01BDB	GWSI	600243	—	354018114094201	35-48174	213,781	3,951,947	1/1/1978	740	0 - 12	8	12 - 740	3,302	1/26/2006	641.0	2,661.0	PROD / D	—	8	8	ROBERT RILEY
B(26-18) 01BBB	Wells55	600243	—	—	—	213,462	3,952,429	1/26/1978	740	- 50	8	—	—	—	650.0	—	PROD / D	—	8	8	CHOVAN, FRANK & DEBRA L
B(26-18) 01BBB	Wells35	—	13914	354018114094201	35-48174	213,462	3,952,429	1/26/1978	740	0 - 50	8	—	—	—	650.0	—	PROD / D	D	—	8	RILEY , Robert
B(26-18) 01BDC	Wells55	556106	—	—	—	213,846	3,951,814	10/2/1996	831	- 831	5	—	—	—	642.0	—	PROD / D	D	12	12	GODE, GENE,
B(26-18) 01CCC	Wells55	583326	—	—	—	213,424	3,951,024	10/30/2000	880	- 880	5	—	—	—	660.0	—	PROD / D	D	10	10	LEAVITT, JAMES
B(26-18) 01CCC	Wells55	599681	—	—	—	213,424	3,951,024	9/11/2003	1,015	- 1,015	5	—	—	—	984.0	—	PROD / D	D	—	5	ROBISON, OWEN DON
B(26-18) 01DBB	Wells55	201049	—	—	—	214,240	3,951,601	1/14/2004	890	- 890	5	—	—	—	625.0	—	PROD / D	D	5	5	BOTTORFF, ROBERT & SHIRLE

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY,
MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(26-18) 03AAA1	GWSI	641124	—	354036114110601	INDEX BK28, 35-78021	211,721	3,952,532	7/14/1979	700	0 - 700	7	600 - 700	3,300	1/26/2006	557.4	2,742.6	PROD / D	D	16	16	BOYLAN
B(26-18) 03AAA	Wells55	641124	—	—	—	211,653	3,952,481	8/3/1979	700	- 700	7	—	—	—	560.0	—	PROD / D	—	14	14	BOYLAN ET AL,V
B(26-18) 03AAA	Wells35	—	13915	354036114110601	35-78021	211,653	3,952,481	7/14/1979	700	0 - 700	7	600 - 700	—	—	560.0	—	PROD / D	D	—	12	BOYLAN , Vernon
B(26-18) 03AAA2	GWSI	—	—	354033114110901	35-47611	211,643	3,952,473	10/1/1977	665	0 - 665	6	580 - 665	3,307	—	—	—	PROD / D	D	7	7	GEORGE S HUNT
B(26-18) 03BAA	Wells35	—	13916	354033114110901	35-47611	210,847	3,952,508	10/19/1977	665	0 - 665	6	580 - 660	—	—	570.0	—	PROD / D	D	—	7	HUNT , GEORGE
B(26-18) 03AAC	Wells55	210532	—	—	—	211,445	3,952,287	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BLANCHARD, THOMAS L
B(26-18) 03ADD	Wells55	582618	—	—	—	211,635	3,951,880	8/30/2000	745	- 745	5	—	—	—	635.0	—	PROD / D	D	6	6	YAGER, WM
B(26-18) 03BAA	Wells55	204454	—	—	—	210,847	3,952,508	—	773	- 773	5	—	—	—	572.0	—	PROD / D	D	—	—	MARTIN, BOB L & LOJETTA
B(26-18) 03BDB	Wells55	202941	—	—	—	210,635	3,952,113	5/23/2004	798	- 790	5	730 - 790	—	—	583.0	—	PROD / D	D	—	—	GREENWOOD, DARLYNN
B(26-18) 03CCC	GWSI	511036	—	353947114120701	—	210,141	3,951,097	5/15/1985	635	0 - 20	7	590 - 635	3,420	1/26/2006	544.4	2,875.6	PROD / D	D	—	—	JACK HAWKINS
B(26-18) 03CCC	GWSI	511036	—	353947114120701	—	210,141	3,951,097	5/15/1985	635	0 - 635	4	590 - 635	3,420	1/26/2006	544.4	2,875.6	PROD / D	D	—	—	JACK HAWKINS
B(26-18) 03CCC	Wells55	511036	—	—	—	210,205	3,951,122	5/15/1985	635	- 635	7	—	—	—	550.0	—	PROD / D	D	7	7	HAWKINS,J
B(26-18) 05BAD	GWSI	509650	—	354023114134601	—	207,776	3,952,396	12/20/1984	700	0 - 20	7	450 - 700	3,565	1/26/2006	612.6	2,952.4	PROD / D	D	—	—	SUE LONG
B(26-18) 05BAD	GWSI	509650	—	354023114134601	—	207,776	3,952,396	12/20/1984	700	0 - 700	4	450 - 700	3,565	1/26/2006	612.6	2,952.4	PROD / D	D	—	—	SUE LONG
B(26-18) 05BAC	Wells55	509650	—	—	—	207,419	3,952,416	12/20/1984	700	- 700	7	—	—	—	450.0	—	PROD / D	D	—	—	LONG,S
B(26-18) 05BDB	Wells55	565127	—	—	—	207,414	3,952,216	12/9/1997	825	- 825	4	—	—	—	675.0	—	PROD / D	D	5	—	HALL, DONALD L
B(26-18) 05DBB	GWSI	603219	—	354008114133901	35-68910	207,841	3,951,838	8/1/1978	700	0 - 700	6	0 - 700	3,540	1/26/2006	566.0	2,974.0	PROD / D	—	—	—	ROBERT GRIMES
B(26-18) 05DDB	Wells55	603219	—	—	—	208,194	3,951,390	1/1/1978	700	- 700	6	—	—	—	580.0	—	PROD / D	—	20	20	GRIMES,R G
B(26-18) 05DDB	Wells35	—	13917	354008114133901	35-68910	208,194	3,951,390	8/10/1978	700	0 - 700	6	600 - 700	—	—	580.0	—	PROD / D	D	—	11	GRIMES , Bob
B(26-18) 05DCB	Wells55	538419	—	—	—	207,793	3,951,403	3/20/1993	750	- 750	7	—	—	—	600.0	—	PROD / D	D	15	12	POFF, HELEN BRIGGS,
B(26-18) 05DCC	Wells55	210399	—	—	—	207,788	3,951,202	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WODETZKI, EDWARD & MARILY
B(26-18) 05DDD	Wells55	530172	—	—	—	208,389	3,951,183	1/10/1991	700	- 700	7	—	—	—	580.0	—	PROD / D	D	5	5	BONNER, WILLA LEE,
B(26-18) 07BDD	Wells55	204952	—	—	—	205,965	3,950,441	—	600	- 600	5	—	—	—	515.0	—	PROD / D	D	—	—	LEMIEUX, ARMAND
B(26-18) 07CAA	Wells55	582858	—	—	—	205,958	3,950,239	9/21/2000	605	- 605	5	—	—	—	480.0	—	PROD / D	D	—	—	BOHANNON, CARROLL & MILDR
B(26-18) 07CDD	Wells55	529435	—	—	—	205,938	3,949,633	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	BREWER, HERMAN,K
B(26-18) 07DDD	Wells55	583407	—	—	—	206,731	3,949,622	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	LEMIEUX, ARMAND
B(26-18) 09AAA	Wells55	558311	—	—	—	209,997	3,950,927	7/15/1996	660	- 660	7	—	—	—	560.0	—	PROD / D	D	5	5	BREWER, SOPHIE,
B(26-18) 09AAA	Wells55	560451	—	—	—	209,997	3,950,927	1/8/1997	710	- 710	7	—	—	—	640.0	—	PROD / D	D	—	—	MEDHUS, MILO
B(26-18) 09AAB	Wells55	566079	—	—	—	209,794	3,950,934	—	750	- 750	7	—	—	—	680.0	—	PROD / D	D	—	—	WILLIAMS, CAROLYN
B(26-18) 09ABA	Wells55	525754	—	—	—	209,593	3,950,941	10/18/1989	693	- 691	7	—	—	—	555.0	—	PROD / D	D	12	50	HAMER, MARY,
B(26-18) 09ABD	Wells55	204919	—	—	—	209,587	3,950,739	—	750	- 750	5	—	—	—	580.0	—	PROD / D	D	—	—	JOSE, PATSY L & DONAL
B(26-18) 09ACC	Wells55	599901	—	—	—	209,375	3,950,343	—	—	- 780	5	—	—	—	565.0	—	PROD / D	D	—	—	GANN, EDWARD E
B(26-18) 09BAA	GWSI	—	—	353939114124501	—	209,165	3,950,897	—	—	—	—	—	3,435	1/31/2006	520.1	2,914.9	—	—	—	—	—
B(26-18) 09BAA	Wells55	203711	—	—	—	209,189	3,950,954	7/26/2004	652	- 652	5	—	—	—	518.0	—	PROD / D	D	7	10	PARKERSON, LAWRENCE L
B(26-18) 09BAD	Wells55	550657	—	—	—	209,184	3,950,752	7/6/1995	640	- 640	7	—	—	—	560.0	—	PROD / D	D	6	6	MONCRIEF, WILLIAM,
B(26-18) 09BBB	GWSI	—	—	353942114131201	—	208,511	3,951,008	—	—	—	—	—	3,460	1/31/2006	523.9	2,936.1	—	—	—	—	—
B(26-18) 09BBB	Wells55	203051	—	—	—	208,584	3,950,974	—	727	- 727	5	—	—	—	522.0	—	PROD / D	D	—	—	ABPLANALP, LARENA MURRAY
B(26-18) 09BCA	Wells55	547212	—	—	—	208,775	3,950,564	12/10/1995	665	- 665	7	—	—	—	590.0	—	PROD / D	D	—	—	DOWDY, GARY,
B(26-18) 09BCA	Wells55	564916	—	—	—	208,775	3,950,564	—	765	- 765	4	—	—	—	665.0	—	PROD / D	D	—	—	MOSER, JULIA
B(26-18) 09BCC	Wells55	545062	—	—	—	208,568	3,950,369	8/22/1994	665	- 665	7	—	—	—	580.0	—	PROD / D	D	—	—	MARTIN, JOHN,W
B(26-18) 09BCC	Wells55	597392	—	—	—	208,568	3,950,369	—	—	—	—	—	—	—	—	—	PROD	—	—	—	JOSHUA HILLS WATER COMPAN
B(26-18) 09CAD	Wells55	205482	—	—	—	209,162	3,949,947	10/26/2004	810	- 790	6	790 - 810	—	—	700.0	—	PROD / D	D	—	—	ZIMMERMAN, WILLIAM
B(26-18) 09CBB	Wells55	209872	—	—	—	208,562	3,950,168	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ANDERSON, MICHAEL J & EAR
B(26-18) 09CBC	Wells55	206001	—	—	—	208,557	3,949,966	—	790	- 790	7	—	—	—	580.0	—	PROD / C	D	—	—	JOSHUA HILLS WATER COMPAN
B(26-18) 09CBC	Wells55	561758	—	—	—	208,557	3,949,966	4/21/1997	690	- 690	7	—	—	—	580.0	—	PROD / D	D	—	—	GLENN WARREN MOORE,
B(26-18) 09CBD	Wells55	209026	—	—	—	208,759	3,949,960	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WARE, DENNIS
B(26-18) 09CCB2	GWSI	504595	—	353903114130801	—	208,562	3,949,806	11/20/1982	715	0 - 423	9	423 - 715	3,522	1/26/2006	501.0	3,021.0	PROD / MUN	D	37	37	JOSHUA HILLS ASSOC WATER CO
B(26-18) 09CCA	Wells55	504595	—	—	—	208,754	3,949,758	11/20/1982	715	- 423	8	—	—	—	580.0	—	PROD / D	D	34	34	JOSHUA HILLS ASSOC,
B(26-18) 09CCB1	GWSI	—	—	353903114130701	—	208,559	3,949,797	—	—	—	—	—	3,522	—	—	—	U	—	—	—	JOSHUA HILLS ASSOC WATER CO
B(26-18) 09CCD	Wells55	549551	—	—	—	208,748	3,949,557	5/14/1995	660	—	7	—	—	—	580.0	—	PROD / D	D	10	10	KEES, BARBARA J
B(26-18) 09CDD	Wells55	200871	—	—	—	209,151	3,949,544	—	695	- 695	6	—	—	—	605.0	—	PROD / D	D	—	—	BAUGH, PHILIP M & ALTH
B(26-18) 09CDD	Wells55	525753	—	—	—	209,151	3,949,544	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	ASHER, CLARENCE,
B(26-18) 09CDD	Wells55	531115	—	—	—	209,151	3,949,544	7/27/1991	632	- 632	5	—	—	—	520.0	—	PROD / D	D	11	—	ASHER, CLARENCE,
B(26-18) 09DAB	Wells55	205480	—	—	—	209,772	3,950,129	—	910	- 910	6	—	—	—	720.0	—	PROD / D	D	—	—	LAMBERT, LEONARD & CHERY
B(26-18) 09DBC	Wells55	562058	—	—	—	209,364	3,949,940	4/6/1997	700	- 700	7	—	—	—	590.0	—	PROD / D	D	8	8	BENTON, HERMAN,
B(26-18) 09DCC	Wells55	202656	—	—	—	209,352	3,949,537	—	650	- 650	6	—	—	—	520.0	—	PROD / D	D	—	—	PURDER, INGRID G
B(26-18) 09DCD	Wells55	205244	—	—	—	209,554	3,949,531	—	645	- 645	6	—	—	—	520.0	—	PROD / D	D	—	10	ANTHONY, CARL DAVID
B(26-18) 09DDB	Wells55	583670	—	—	—	209,761	3,949,726	11/10/2000	645	- 645	5	—	—	—	—	—	PROD / D	D	8	8	GARY, CARROLL
B(26-18) 11AAA	Wells55	557303	—	—	—	213,216	3,950,829	5/18/1996	860	- 860	7	—	—	—	770.0	—	PROD / D	D	7	7	HIGGINBOTHAM,,
B(26-18) 11AAA	Wells55	560112	—	—	—	213,216	3,950,829	12/18/1996	940	- 940	7	—	—	—	720.0	—	PROD / D	D	—	—	LEE, MARVIN,J
B(26-18) 11ABD	Wells55	205850	—	—	—	212,806	3,950,640	—	850	- 850	5	—	—	—	710.0	—	PROD / D	D	—	—	BUNDY, HARRY C
B(26-18) 11ADC	Wells55	208251	—	—	—	212,994	3,950,231	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	JACKSON, IRIS
B(26-18) 11ADC1	GWSI	511038	—	353924114101401	—	212,930	3,950,290	6/20/1985	850	0 - 20	7	20 - 850	3,480	1/31/2006	645.6	2,834.4	U	D	—	—	IRIS JACKSON
B(26-18) 11CCA	Wells55	511038	—	—	—	211,971	3,949,658	6/20/1985	850	- 20	7	—	—	—	—	—	X / D	D	—	—	JACKSON, IRIS,
B(26-18) 11BAD	Wells55	207600	—	—	—	212,404	3,950,651	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	DAVIDSON, HAROLD L

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(26-18) 11BCA	Wells55	569789	—	—	—	211,995	3,950,482	9/12/1998	930	- 930	7	—	—	—	800.0	—	PROD / D	D	10	5	WIRT, RICHARD E
B(26-18) 11BCC	Wells55	569711	—	—	—	211,788	3,950,267	9/25/1998	895	- 895	7	—	—	—	780.0	—	—	D	7	7	BLANCHARD, NORMAN
B(26-18) 11BDA	Wells55	553541	—	—	—	212,398	3,950,450	4/16/1996	880	- 880	4	—	—	—	780.0	—	PROD / D	D	7	10	BARRON, CLIFFORD,
B(26-18) 11BDB	Wells55	530531	—	—	—	212,198	3,950,456	1/25/1991	900	- 900	7	—	—	—	750.0	—	PROD / D	D	—	—	KARALIUS, VITALIJUS,J
B(26-18) 11BDD	Wells55	569478	—	—	—	212,391	3,950,249	—	819	- 819	5	—	—	—	658.0	—	PROD / D	D	10	10	GODE, MITCHELL
B(26-18) 11CAA	Wells55	535397	—	—	—	212,385	3,950,048	6/25/1992	860	- 860	7	—	—	—	780.0	—	PROD / D	D	7	10	JARED, JIM,
B(26-18) 11CAC	Wells55	589311	—	—	—	212,178	3,949,853	11/10/2001	750	- 750	5	—	—	—	630.0	—	PROD / D	D	—	—	THOMAS, KEITH
B(26-18) 11DCD	GWSI	515291	—	353857114102201	—	212,730	3,949,476	9/4/1986	508	0 - 20	6	460 - 500	3,601	—	—	—	PROD / D	P	—	—	CONNIE CLARK
B(26-18) 11DCD	GWSI	515291	—	353857114102201	—	212,730	3,949,476	9/4/1986	508	0 - 508	5	460 - 500	3,601	—	—	—	PROD / D	P	—	—	CONNIE CLARK
B(26-18) 11DDD	Wells55	515291	—	—	—	213,169	3,949,419	9/4/1986	508	- 508	6	—	—	—	300.0	—	PROD / D	D	8	9	FORSYTHE, JUDITH,A
B(26-18) 17AAA	GWSI	525065	—	353841114131301	—	208,411	3,949,123	10/23/1989	685	0 - 20	8	620 - 685	3,570	—	—	—	PROD / D	D	—	—	CARROLL BOARDMAN
B(26-18) 17AAA	GWSI	525065	—	353841114131301	—	208,411	3,949,123	10/23/1989	685	15 - 685	4	620 - 685	3,570	—	—	—	PROD / D	D	—	—	CARROLL BOARDMAN
B(26-18) 17AAA	Wells55	525065	—	—	—	208,337	3,949,368	10/23/1989	685	- 685	8	—	—	—	565.0	—	PROD / D	D	12	50	FREDERICKSON, MARILYN
B(26-18) 17AAB	Wells55	552051	—	—	—	208,135	3,949,375	10/2/1996	700	- 700	7	—	—	—	600.0	—	PROD / D	D	10	10	FORD, JOHN,G
B(26-18) 17AAC	Wells55	588691	—	—	—	208,129	3,949,174	9/20/2001	650	- 650	5	—	—	—	550.0	—	PROD / D	D	10	10	HENSEN, JAMES A
B(26-18) 17ABA	GWSI	801891	—	353847114133001	—	207,839	3,949,327	—	691	0 -	4	—	3,560	—	—	—	PROD / D	—	—	—	F E GILBERT
B(26-18) 17ABA	GWSI	801891	—	353847114133001	—	207,839	3,949,327	—	691	0 -	4	—	3,560	—	—	—	PROD / D	—	—	—	FOREST
B(26-18) 17	Wells55	801891	—	—	—	207,810	3,948,687	1/28/1972	690	—	6	—	—	—	690.0	—	PROD / I	—	—	—	ANDREWS, MICHAEL L
B(26-18) 17BBA	Wells55	589058	—	—	—	207,126	3,949,408	11/3/2001	600	- 600	5	—	—	—	480.0	—	PROD / D	D	—	—	MCGRAW, DAVID L
B(26-18) 18DDD	Wells55	593571	—	—	—	206,684	3,948,013	—	600	- 600	5	—	—	—	500.0	—	PROD / D	D	—	—	LEMIEUX, ARMAND
B(26-18) 19AAA	Wells55	556584	—	—	—	206,677	3,947,811	10/15/1995	645	- 645	7	—	—	—	540.0	—	PROD / D	D	—	—	SCHLAX, CECIL
B(26-18) 19ABD	Wells55	599617	—	—	—	206,272	3,947,618	11/7/2003	753	- 753	5	—	—	—	501.0	—	PROD / D	D	5	6	FOLEY, RAY G & BETTY J
B(26-18) 19CBA	Wells55	208447	—	—	—	205,458	3,947,031	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WILLIAM L OR DONNA MASSEY
B(26-18) 17CBB	Wells55	209609	—	—	—	206,901	3,948,610	—	600	- 600	5	—	—	—	495.0	—	PROD / D	D	—	—	TOMAN, JOHN EDWARD
B(26-18) 19CBC	Wells55	583063	—	—	—	205,248	3,946,837	10/5/2000	730	- 730	5	—	—	—	403.0	—	PROD / D	D	9	9	THOMPSON, JAMES & B JUNE
B(26-18) 19CDA	Wells55	530234	—	—	—	205,844	3,946,621	—	—	—	—	—	—	—	—	—	PROD / UTIL	—	—	—	MT TIPTON WATER CO,
B(26-18) 19DAD	Wells55	512354	—	—	—	206,649	3,948,800	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WOLFFE,G
B(26-18) 19DDD	Wells55	511695	—	—	—	206,638	3,946,395	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	FOLEY, RAY G & BETTY J
B(26-18) 19DDD	Wells55	515502	—	—	—	206,638	3,946,395	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	FOLEY, RAY & BETTY,
B(26-18) 19DDD	Wells55	521859	—	—	—	206,638	3,946,395	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	FOLEY, RAY & BETTY,
B(26-18) 21BAA	Wells55	581656	—	—	—	209,093	3,947,729	7/18/2000	700	- 700	5	—	—	—	560.0	—	PROD / D	D	10	10	MEISTER, GEORGE & ELKE
B(26-18) 29AAC	Wells55	586574	—	—	—	208,033	3,945,948	6/14/2001	200	- 200	5	—	—	—	50.0	—	PROD / D	D	—	—	ELIADES, KATERINA
B(26-18) 29ABC	Wells55	202837	—	—	—	207,631	3,945,960	—	300	- 300	5	—	—	—	145.0	—	PROD / D	D	—	—	TIUTIUCA, NICOLAE
B(26-18) 29ACB	Wells55	200055	—	—	—	207,625	3,945,759	—	350	- 350	6	—	—	—	280.0	—	PROD / D	D	—	—	TAYLOR, JOHN L
B(26-18) 29ACC	Wells55	202354	—	—	—	207,619	3,945,557	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	ELIADES, HARRY
B(26-18) 29ACC	Wells55	578077	—	—	—	207,619	3,945,557	12/20/1999	400	- 400	5	—	—	—	260.0	—	PROD / D	D	—	—	MCNUTT, CLARENCE A & JU
B(26-18) 29ACD	Wells55	596294	—	—	—	207,620	3,945,551	—	300	—	7	—	—	—	210.0	—	PROD / D	D	—	—	MCMURTRY, JOHNNIE C.
B(26-18) 29BAA	Wells55	574047	—	—	—	207,436	3,946,168	7/15/1999	311	- 311	5	—	—	—	104.0	—	PROD / D	D	—	—	ELIADES, HARRY
B(26-18) 29BAC	Wells55	589925	—	—	—	207,229	3,945,972	11/30/2001	305	- 305	5	—	—	—	245.0	—	PROD / D	D	—	—	DESZAMP, TERESA
B(26-18) 29BBD	Wells55	202260	—	—	—	207,028	3,945,978	—	200	- 200	6	—	—	—	110.0	—	PROD / D	D	—	—	POLSTON, ARTIS RAY
B(26-18) 29BCD	Wells55	541238	—	—	—	207,016	3,945,576	11/21/1993	200	- 200	7	—	—	—	60.0	—	PROD / D	D	15	15	DOWDY, CLOID,
B(26-18) 29BCD	Wells55	561827	—	—	—	207,016	3,945,578	4/17/1997	250	- 250	5	—	—	—	84.0	—	PROD / D	D	—	—	BOWLES, TIMOTHY,A
B(26-18) 29BDD	Wells55	205481	—	—	—	207,418	3,945,563	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	MERRILL, ROBERT J
B(26-18) 29BDD	Wells55	529826	—	—	—	207,418	3,945,563	11/23/1990	250	- 250	7	—	—	—	83.0	—	PROD / D	D	—	—	TAYLOR, RAYMOND,
B(26-18) 29BDD	Wells55	529827	—	—	—	207,418	3,945,563	1/2/1991	265	- 265	7	—	—	—	81.0	—	PROD / D	D	—	—	POLSTON, ARTIS RAY
B(26-18) 29CAA	Wells55	552797	—	—	—	207,413	3,945,362	11/15/1995	205	- 205	7	—	—	—	120.0	—	PROD / D	D	—	12	ALBEE, ROBERT,
B(26-18) 29CAB	Wells55	562710	—	—	—	207,212	3,945,368	6/11/1997	255	- 255	5	—	—	—	63.0	—	PROD / D	D	—	—	COOK, THOMAS,A
B(26-18) 29DAA	Wells55	575666	—	—	—	208,217	3,945,337	—	450	- 450	—	—	—	—	—	—	PROD / D	D	—	—	MASON, PAUL AND MARY
B(26-18) 29DAA	Wells55	576394	—	—	—	208,217	3,945,337	12/7/1999	194	- 194	6	—	—	—	84.0	—	PROD / D	D	10	10	MITCHELL JR, THOMAS O
B(26-18) 29DBB	Wells55	202353	—	—	—	207,614	3,945,356	—	—	—	—	—	—	—	—	—	PROD / I	—	—	—	ELIADES, HARRY
B(26-19) 13	Wells55	202524	—	—	—	204,409	3,948,762	—	—	—	—	—	—	—	—	—	—	—	—	—	FETT, COLONEL
B(26-19) 13	Wells55	202525	—	—	—	204,409	3,948,762	—	—	—	—	—	—	—	—	—	—	—	—	—	FETT, COLONEL
B(26-19) 13AAC	Wells55	524525	—	—	—	204,928	3,949,250	1/30/1990	575	- 575	8	—	—	—	500.0	—	PROD / D	D	—	—	STUART, CHARLES & N.
B(26-19) 13AAD	Wells55	536185	—	—	—	205,130	3,949,244	10/5/1992	500	- 500	7	—	—	—	400.0	—	PROD / D	D	—	—	HUFFMAN, MARJORIE,E
B(26-19) 13ABD	Wells55	544225	—	—	—	204,728	3,949,256	7/9/1994	565	- 565	7	—	—	—	480.0	—	PROD / D	D	14	14	KEARNS, JOHN,
B(26-19) 13ADD	Wells55	528556	—	—	—	205,116	3,948,843	8/27/1990	500	- 500	7	—	—	—	441.0	—	PROD / D	D	20	20	CORNESS, WAYNE C
B(26-19) 13BBC	Wells55	584851	—	—	—	203,724	3,949,285	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	VANDENHENDE, CHARLES
B(26-19) 13CBB	Wells55	591489	—	—	—	203,704	3,948,681	—	645	- 645	5	—	—	—	510.0	—	PROD / D	D	2	2	VAN DEN HENDE, CHARLES H
B(26-19) 13CDC	Wells55	599902	—	—	—	204,085	3,948,068	—	—	- 600	5	—	—	—	460.0	—	PROD / D	D	—	—	GANN, WILLIAM IRVIN
B(26-19) 13DBD	Wells55	529145	—	—	—	204,700	3,948,452	9/20/1990	500	- 500	7	—	—	—	425.0	—	PROD / D	D	15	5	BRIGHT, MAHLON,L
B(26-19) 25AAC	Wells55	646306	—	—	—	204,819	3,946,051	8/9/1977	150	- 150	8	—	—	—	40.0	—	PROD / D	—	—	—	DEMATTOS,N J
B(26-19) 25AAC	Wells35	—	13921	—	35-39890	204,819	3,946,051	8/9/1977	150	0 - 150	8	70 - 150	—	—	110.0	—	PROD / D	D	—	30	DeMATTOS, Walter
B(26-19) 25ACD	Wells55	509326	—	—	—	204,608	3,945,656	12/5/1984	475	- 45	7	—	—	—	350.0	—	PROD / D	D	25	25	STONE,T
B(26-19) 36ACA	GWSI	520733	—	353536114154001	WELL NO. 3	204,544	3,944,159	9/18/1988	540	0 - 540	6	530 - 540	3,485	—	—	—	PROD / MUN	D	10	10	MOUNT TIPTON WATER CO.
B(26-19) 36ACA	Wells55	520733	—	—	—	204,560	3,944,247	9/18/1988	540	- 540	8	—	—	—	383.0	—	PROD / UTIL	D	15	75	AZ STATE LAND DEPT.

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(27-16) 17AAA	Wells55	600502	—	—	—	227,929	3,958,406	—	185	—	—	—	—	—	—	—	PROD / S	—	—	—	DUEY, BOB E & JONETTA
B(27-16) 25DBD	GWSI	—	—	354147113582701	—	233,894	3,954,062	—	—	—	—	—	3,065	—	—	—	X / U	—	—	—	—
B(27-16) 29CCD	GWSI	—	—	354132114012001	USGS RL-1	228,513	3,953,823	—	59	0	8	—	2,758	3/25/1980	—	—	U	—	—	—	—
B(27-16) 33BAA	GWSI	800970	—	354130113595601	—	228,673	3,953,621	1/1/1963	500	0 - 400	8	400 - 500	2,792	1/12/2006	349.8	2,442.4	U	—	—	—	LINCOLN
B(27-16) 33BAA	Wells55	800970	—	—	—	228,586	3,953,554	1/1/1963	500	- 400	8	—	—	—	352.0	—	PROD / D	—	25	25	PETERSON,T F
B(27-16) 33BAA	Wells35	—	13935	—	—	228,586	3,953,554	1/1/1963	500	- 400	8	—	—	—	357.0	—	PROD / A	P	—	—	—
B(27-17) 05ADB	GWSI	—	—	354531117070201	—	218,137	3,961,456	—	—	—	—	—	2,866	2/9/2006	497.3	2,368.7	—	—	—	—	—
B(27-17) 05ADC	Wells55	587889	—	—	—	218,150	3,961,350	9/8/2001	585	- 585	5	—	—	—	500.0	—	PROD / D	D	10	10	ABERNATHY, GENE
B(27-17) 05ADC	Wells55	904068	—	—	—	218,150	3,961,350	2/16/2006	—	—	—	—	—	—	—	—	D	—	—	—	LEE, JEFF & JULIE
B(27-17) 13A	M&A	—	—	—	SWE-1D, O&G # P-913	224,400	3,958,250	12/18/2001	3,126	0 - 860	12	—	—	—	—	—	K	G, P	—	—	Red Lake Gas Storage, LP,
B(27-17) 15CDD	Wells55	544732	—	—	—	220,652	3,957,239	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WHITE HILLS WATER CO,
B(27-17) 15DBD	Wells55	544730	—	—	—	221,067	3,957,629	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WHITE HILLS WATER,
B(27-17) 15DCD	Wells55	544731	—	—	—	221,055	3,957,227	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WHITE HILLS WATER,
B(27-17) 15DDD	Wells55	544729	—	—	—	221,458	3,957,215	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	WHITE HILLS WATER,
B(27-17) 19CCA1	GWSI	—	—	354233114084301	—	215,434	3,958,053	—	—	—	—	—	3,082	—	—	—	U	—	—	—	—
B(27-17) 19CCA2	GWSI	600504	—	354233114084201	—	215,451	3,958,025	8/1/1965	840	0 - 640	12	520 - 630	3,082	1/19/2006	502.0	2,580.0	PROD / S	—	90	90	NEAL
B(27-17) 19CCC	Wells55	600504	—	—	—	215,179	3,955,809	—	700	—	—	—	—	—	—	—	PROD / S	—	—	—	AGUILA STORAGE AND TRANSP
B(27-17) 19CDA	Wells35	—	13936	—	—	215,784	3,955,991	8/1/1965	840	0 - 640	12	520 - 630	—	—	135.0	—	PROD / A	D	—	90	NEAL, J
B(27-17) 23CAC	M&A	640651	—	—	RL-2	222,074	3,956,015	—	602	0 - 602	20	399 - 602	—	10/24/2005	364.0	—	—	—	—	1,700	—
B(27-17) 23CAC	GWSI	640651	—	354238114042201	—	222,078	3,956,016	5/1/1973	800	0 - 800	20	0 - 800	2,765	1/18/2006	365.6	2,399.4	U	D	3,000	3,000	NEAL
B(27-17) 23AAB	Wells55	640651	—	—	Valley Tank Well	222,856	3,956,866	—	—	—	—	—	—	—	—	—	PROD / S	—	—	—	AGUILA STORAGE AND TRANSP
B(27-17) 23CAC	Wells35	—	37019	—	—	222,024	3,955,984	5/1/1973	800	0 - 800	20	0 - 800	—	—	381.0	—	—	—	—	3,000	Neal, J
B(27-17) 23CAC	Wells35	—	13937	—	35-23319	222,024	3,955,984	6/1/1973	610	0 - 610	20	380 - 605	—	—	380.0	—	PROD / A	D	—	3,000	NEAL, J
B(27-18) 05BD	Wells55	642318	—	—	—	207,818	3,961,788	—	51	—	6	—	—	—	32.0	—	PROD / S	—	—	—	BLM-PHOENIX DISTRICT,
B(27-18) 07CA	Wells55	637016	—	—	—	208,158	3,959,805	1/1/1954	120	- 120	6	—	—	—	80.0	—	PROD / S	—	15	15	ARIZONA ACREAGE LLC
B(27-18) 12CA	Wells55	642299	—	—	—	214,190	3,959,561	—	—	—	—	—	—	—	—	—	PROD / S	—	—	—	BLM-PHOENIX DISTRICT,
B(27-18) 05DAC	Wells55	206464	—	—	—	218,449	3,970,613	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	THE BERBARI REVOCABLE FAM
B(28-17) 09AAA	GWSI	—	—	355010114054601	—	220,319	3,970,013	—	—	—	—	—	3,560	2/1/2006	595.2	2,964.8	—	—	—	—	—
B(28-17) 09AAA	Wells55	206465	—	—	—	220,243	3,969,949	2/22/2005	1,505	- 1,480	5	—	—	—	790.0	—	PROD / D	D	—	—	JOSHUA TREE PARTNERS I LL
B(28-17) 09CCD	Wells55	595071	—	—	—	218,977	3,968,578	—	—	—	—	—	—	—	—	—	PROD / D	—	—	—	SHIELDS, BRYON K
B(28-17) 09CCD	Wells55	596409	—	—	—	218,977	3,968,578	—	700	- 22	8	—	—	—	—	—	PROD / D	D	—	—	SHIELDS, BRYON K
B(28-17) 17CCD	GWSI	—	—	354829114074001	—	217,366	3,966,988	—	—	—	—	—	2,965	1/31/2006	632.2	2,332.8	—	—	—	—	—
B(28-17) 17CDD	Wells55	584805	—	—	—	217,726	3,966,994	2/2/2001	772	- 772	9	—	—	—	635.0	—	PROD / D	D	—	—	EAMES, DWIGHT
B(28-17) 31AAA	GWSI	—	—	354837114075901	—	216,778	3,963,533	—	—	—	—	—	2,875	1/18/2006	536.2	2,338.8	—	—	—	—	—
B(28-17) 31AAA	Wells55	208801	—	—	Stockton Hill	216,815	3,963,805	11/28/2005	—	—	—	555 - 990	—	—	—	—	PROD / C	—	—	—	PIERCE FERRY LLC
B(28-17) 31CCC	Wells55	208802	—	—	Kathy	215,372	3,962,241	12/8/2005	—	—	—	444 - 714	—	—	—	—	PROD / C	—	—	—	PIERCE FERRY LLC
B(28-17) 31CCC1	GWSI	805894	—	354552114085001	INDEX BK28	215,308	3,962,154	—	800	—	—	—	3,004	10/25/2005	852.5	2,351.5	U	—	—	—	DALE D SMITH
B(28-17) 31CCC	Wells55	805894	—	—	—	215,385	3,962,235	12/31/1962	600	- 600	8	—	—	—	440.0	—	PROD / S	—	15	—	SMITH, DALE,D
B(28-17) 31CCC	Wells35	—	13955	—	—	215,385	3,962,236	—	800	—	8	—	—	—	655.0	—	PROD / A	P	—	—	—
B(28-17) 31DDD	GWSI	—	—	354552114075501	—	216,826	3,962,149	—	—	—	—	—	2,905	1/18/2006	562.4	2,342.6	—	—	—	—	—
B(28-17) 31DDD	Wells55	208803	—	—	Elna-1	216,770	3,962,198	10/15/2005	—	—	—	882 - 1,490	—	—	—	—	PROD / C	—	—	—	PIERCE FERRY LLC
B(28-17) 33CCC	Wells55	208806	—	—	—	218,578	3,962,142	—	—	—	—	—	—	—	—	—	PROD / C	—	—	—	ARIZONA ACREAGE LLC
B(28-18) 13CDA	GWSI	—	—	354836114093001	—	214,621	3,967,283	—	—	—	—	—	2,842	1/18/2006	541.9	2,300.1	—	—	—	—	—
B(28-18) 13CDA	Wells55	208833	—	—	—	214,546	3,967,291	—	—	—	—	—	—	—	—	—	PROD / C	—	—	—	HUALAPAI WATER COMPANY
B(28-18) 13CDA	Wells55	203012	—	—	—	214,546	3,967,291	6/25/2004	950	- 950	6	—	—	—	546.0	—	PROD / C	D	42	42	HUALAPAI WATER COOPERATIV
B(28-18) 13DCB	Wells55	208805	—	—	Pocket-A	214,697	3,967,285	12/6/2005	—	—	—	551 - 1,041	—	—	—	—	—	—	—	—	—
B(28-18) 13DCB	Wells55	210023	—	—	—	214,748	3,967,285	11/25/2005	983	- 970	9	—	—	—	560.0	—	PROD / D	D	—	—	ARIZONA ACREAGE LLC
B(28-18) 30C	Wells55	506611	—	—	—	206,136	3,964,440	12/31/1983	—	—	—	—	—	—	—	—	X / NONE	D	—	—	US BORAX,
B(28-18) 30DCB	Wells55	548557	—	—	—	206,619	3,964,325	6/25/1995	605	- 605	6	—	—	—	—	—	MON	D	—	—	NEVADA PACIFIC,
B(28-18) 31	Wells55	530261	—	—	—	206,481	3,963,217	6/30/1991	—	—	—	—	—	—	—	—	MIN / NONE	D	—	—	PRIME EXPLORATION,
B(28-18) 31	Wells55	548571	—	—	—	206,481	3,963,217	1/31/1996	—	—	—	—	—	—	—	—	MIN / NONE	D	—	—	WESTERN STATES MNRLS,
B(28-18) 31	Wells55	562854	—	—	—	206,481	3,963,217	—	—	—	—	—	—	—	—	—	MIN / NONE	—	—	—	NEVADA PACIFIC MININ,
B(28-18) 31B	Wells55	506810	—	—	—	206,106	3,963,633	12/16/1983	—	—	—	—	—	—	—	—	X / NONE	D	—	—	US BORAX,
B(28-18) 31BB	Wells55	521959	—	—	—	205,919	3,963,842	9/20/1988	220	—	—	—	—	—	—	—	MIN / NONE	D	—	—	RANSPOT, HENRY,
B(28-18) 35	Wells55	516524	—	—	—	212,892	3,963,012	1/19/1987	8	- 22	—	—	—	—	—	—	MIN / NONE	D	—	—	SANTA FE PACIFIC,
B(28-18) 35DDD	Wells55	549115	—	—	—	213,571	3,962,286	—	—	—	—	—	—	—	—	—	PROD / MIN	—	—	—	SMITH, DALE,
B(28-18) 35DDD	Wells55	558567	—	—	—	213,571	3,962,286	—	—	—	—	—	—	—	—	—	PROD / MIN	—	—	—	SMITH, DALE,
B(28-18) 35DDD	Wells55	562827	—	—	—	213,571	3,962,286	—	—	—	—	—	—	—	—	—	PROD / MIN	—	—	—	NEVADA PACIFIC MININ,
B(28-19) 14	Wells55	528671	—	—	—	203,457	3,968,144	7/23/1990	500	—	6	—	—	—	—	—	X / NONE	D	—	—	KENNECOTT CORP,
B(28-19) 14	Wells55	550570	—	—	—	203,457	3,968,144	8/1/1995	—	—	—	—	—	—	—	—	MIN / NONE	D	—	—	WESTERN STATES MNRLS,
B(28-19) 24CB	Wells55	506614	—	—	—	204,392	3,966,312	—	—	—	—	—	—	—	—	—	MIN / NONE	D	—	—	US BORAX,
B(28-19) 25DB	Wells55	506613	—	—	—	205,144	3,964,677	—	—	—	—	—	—	—	—	—	X / NONE	D	—	—	US BORAX,
B(28-19) 36	Wells55	539139	—	—	—	204,890	3,963,271	6/11/1993	—	—	—	—	—	—	—	—	MIN / NONE	D	—	—	CAMBIOR EXPLORATION,
B(28-19) 36	Wells55	552160	—	—	—	204,890	3,963,271	6/30/1996	—	—	—	—	—	—	—	—	MIN / NONE	D	—	—	NEVADA PACIFIC MNG,
B(28-19) 36	Wells55	562653	—	—	—	204,890	3,963,271	—	—	—	—	—	—	—	—	—	MIN / NONE	—	—	—	NEVADA PACIFIC MINIG,

TABLE B-1. WELL INVENTORY FOR HUALAPAI VALLEY, MOHAVE COUNTY, ARIZONA

CADASTRAL LOCATION	RECORD SOURCE	ADWR 55-WELL REGISTRY NUMBER	ADWR 35-WELL NUMBER	GWSI SITE ID	WELL NAME, ASLD NUMBER, INDEX WELL BOOK NUMBER, OR ARIZONA OIL AND GAS NUMBER	UTM COORDINATES (NAD 27) Easting (meters)	UTM COORDINATES (NAD 27) Northing (meters)	DATE COMPLETED	WELL DEPTH (feet, bls)	CASING INTERVAL (feet, bls)	CASING DIAMETER (inches)	CASING PERFORATED INTERVAL (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	WATER LEVEL DATE	WATER LEVEL DEPTH (feet, bls)	WATER LEVEL ALTITUDE (feet, msl)	WELL / WATER USE	LOG TYPE	REPORTED PUMPING RATE (gpm)	REPORTED TESTING RATE (gpm)	OWNER
B(28-19) 36AA	Wells55	521957	—	—	—	205,521	3,963,857	9/22/1988	120	—	—	—	—	—	—	—	MIN / NONE	O	—	—	RANSPOT, HENRY,
B(28-19) 36AB	Wells55	506612	—	—	—	205,114	3,963,871	—	—	—	—	—	—	—	—	—	X / NONE	D	—	—	US BORAX,
B(29-17) 28AAB	Wells55	536258	—	—	—	219,533	3,974,797	—	—	—	—	—	—	—	—	—	MIN / NONE	—	—	—	GRANGES INC,
B(29-18) 11AAA	GWSI	621794	—	355527114102801	—	213,568	3,979,995	—	550	0 -	6	—	2,190	12/5/1985	297.0	1,893.0	U	—	—	—	SMITH
B(29-18) 01CCC	Wells55	621794	—	—	—	213,671	3,980,036	—	—	—	—	—	—	—	—	—	PROD / S	—	—	—	PAUL, JAY
B(29-18) 01CCA	M&A	901912	—	—	TB-1	213,963	3,980,140	4/15/2005	531	0 - 520	6	250 - 510	2,160	5/6/2005	253.0	1,907.0	C	—	—	277	SAGEBRUSH ENTERPRISES INC
B(29-18) 11AA	Wells55	637015	—	—	—	213,354	3,979,744	1/1/1961	250	- 250	6	—	—	—	200.0	—	PROD / S	—	10	10	PAUL, JAY
B(29-18) 11AAB	Wells35	—	13963	—	—	213,255	3,979,849	—	—	—	6	—	—	—	298.0	—	PROD / A	P	—	—	—
B(29-18) 13BBA	Wells55	208804	—	—	—	213,802	3,978,212	—	—	—	—	—	—	—	—	—	PROD / MON	—	—	—	ARIZONA ACREAGE LLC
B(29-19) 02AB	Wells55	642307	—	—	—	203,355	3,981,570	—	—	—	—	—	—	—	—	—	PROD / S	—	—	—	BLM-PHOENIX DISTRICT,
B(29-19) 12AB	Wells55	637018	—	—	—	204,910	3,979,994	—	—	—	—	—	—	—	—	—	PROD / S	—	—	—	SMITH,D D
B(30-17) 06	Wells55	514180	—	—	—	216,307	3,990,320	9/19/1986	806	- 20	3	—	—	—	402.0	—	T / NONE	D	—	—	BUREAU OF RECLAM,
B(30-17) 06	Wells55	516370	—	—	—	216,307	3,990,320	1/23/1988	1,148	- 349	3	—	—	—	718.0	—	K / NONE	D	—	—	BUREAU OF RECLAM,
B(30-17) 07BAA	GWSI	—	—	360031114090201	—	216,027	3,989,286	—	—	—	—	—	1,280	—	—	—	U	—	—	—	NPS
B(30-18) 09CBA	GWSI	629127	—	360002114133001	—	209,286	3,988,622	—	94	—	—	—	1,420	9/1/1973	25.0	1,395.0	U	—	—	—	NPS
B(30-18) 09CBA	Wells55	629127	—	—	—	209,331	3,988,832	—	94	—	5	—	—	—	25.0	—	—	—	—	—	NATL PARK SERVICE,

NOTES: This inventory excludes wells located in bedrock areas identified from AZGS, 1998.
Adjacent well data outlined in a single row indicate where multiple well records describe a single well.

ABBREVIATIONS:

Wells35 = pre-1980 well registry system created by the Arizona State Land Department
Wells55 = current ADWR registry of wells
ADWR = Arizona Department of Water Resources
ASLD = Arizona State Land Department
BLM = United States Bureau of Land Management
feet, bls = feet below land surface
feet, msl = feet above mean sea level
gpm = gallons per minute
GWSI = Groundwater Site Inventory (maintained by ADWR)
M&A = E.L. Montgomery & Associates, Inc.
NAD 27 = North American Datum, 1927; wells plotted in Zone 12N
O&G = Arizona Oil and Gas Conservation Commission (administered by the Arizona Geological Survey)
UTM = Universal Transverse Mercator map projection

WELL/WATER USE:

D = Domestic
NONE = No water use
I = Irrigation
U = Unused
C = Commercial
S = Stock
MUN = Municipal/Public Supply
K = Other (Exploration)
IND = Industrial
Z = Other
T = Test
MIN = Mining
PROD = Production
MON = Monitoring
SUB = Subdivision
UTIL = Utility
X = Well Abandoned or Destroyed

LOG TYPE:

D = Driller's
G = Geologist's/Lithologic
P = Geophysical
R = Penetration Rate
Z = Other

SHADING:

Water well on or adjacent to Hualapai Valley Solar (HVS) site
Non-water well on or adjacent to HVS site
Water well within 1.5 miles of HVS site
Selected wells with water quality data more than 1.5 miles from HVS site

EXHIBIT B-2

EXHIBIT B-2: AIR QUALITY ANALYSIS

Air pollutant emission sources at the Hualapai Valley Solar (HVS) Facility (the Facility) will include emergency generators, cooling towers, heat transfer fluid (HTF) processing emissions, HTF heaters, an auxiliary heater, a fueling station, and vehicle traffic. Construction of the facility will also require that the contractor operate a salt melter for approximately five months in order to melt a mixture of salts that will be used to store energy for operation during overcast and night time conditions.

This Exhibit summarizes the air quality conditions and emissions that would result from the operation of the facility. It describes the existing climate and air quality conditions in the area, and the expected air emissions from the Facility. The Facility will be a stationary minor source. Air impact analyses of emissions from minor stationary sources are at the discretion of the permitting agency, the Arizona Department of Environmental Quality (ADEQ).

The Applicant will file an application for a Class II minor source air quality permit for the Facility with ADEQ.

EXISTING CLIMATE AND AIR QUALITY

Regional Topography

The Facility will be located in the Hualapai Valley Basin. The basin is characterized by a wide north-south trending valley, mountains along the west basin margins and cliffs and plateau on the eastern basin boundary. The basin is bounded on the west by the Cerbat and White Mountains, on the east by Grand Wash Cliffs and Music Mountains, on the south by the Peacock and Hualapai Mountains and on the north by Lake Mead. Vegetation types include Mohave desert-scrub, semi-desert grassland, interior chaparral, conifer woodlands and conifer forest.

Regional Climatology

The climate of the Hualapai Valley is arid to semi-arid with hot summers and mild winters. Maximum daily temperatures in the valley floor typically are between 90 and 100°F during the summer, and between 50 to 70°F during the winter. The closest station to the Facility is the Truxton Canyon station with a monthly mean maximum temperature of 95.4°F and minimum of 27.7°F for the period of record (1961-1990). The average annual precipitation measured at the Truxton Canyon station is 10.82 inches (Western Region Climate Center (www.wrcc.dri.edu)). Precipitation falls during two distinct periods of the year: winter precipitation (December, January, February) associated with regional storms that originate from the Pacific Ocean (34% of annual total) and summer precipitation (July, August, September) associated with the Arizona Monsoon (30% of annual total).

Figure 1 shows the wind rose generated from the data collected at the Kingman Airport Station over 5 years, from 2001 to 2005, with a data recovery percentage of 93.85%. The wind rose shows significant flow from the southwest and southeast directions, which is consistent with the

orientation of the basin since the winds are being channeled into the Hualapai Basin due to the topography of the basin.

Existing Air Quality

Air Quality in the vicinity of the Facility meets federal and state standards and is designated as being in attainment for these standards. Background concentrations for criteria pollutants that may be considered for the HVS modeling include: particulate matter less than 10 microns nominal aerodynamic diameter (PM_{10}); particulate matter less than 2.5 microns nominal aerodynamic diameter ($PM_{2.5}$); nitrogen dioxide (NO_2); carbon monoxide (CO); and sulfur dioxide (SO_2). The background concentrations considered representative in the vicinity of the Facility are presented in Table 1.

Table 1
Representative Air Quality near the Hualapai Valley Solar Facility

Pollutant	Averaging Period	Maximum ($\mu g/m^3$)	AAAQS /NAAQS	City/Facility	County
CO	1-Hour	1,828	40,000	Griffith Energy	Mohave
CO	8-Hour	637	10,000	Griffith Energy	Mohave
NO_x	Annual	11	100	Griffith Energy	Mohave
PM_{10}	24-Hour	53	150	Praxair, Kingman SW	Mohave
PM_{10}	Annual	14	50	Praxair, Kingman SW	Mohave
$PM_{2.5}$	24-Hour	12	35	Apache Junction Fire Station	Pinal
$PM_{2.5}$	Annual	6	15	Apache Junction Fire Station	Pinal
SO_2	3-Hour	8	1,305	Griffith Energy	Mohave
SO_2	24-Hour	4	365	Griffith Energy	Mohave
SO_2	Annual	0.4	78	Griffith Energy	Mohave
Ozone	8-Hour	140	150	Pinal Air Park	Pinal

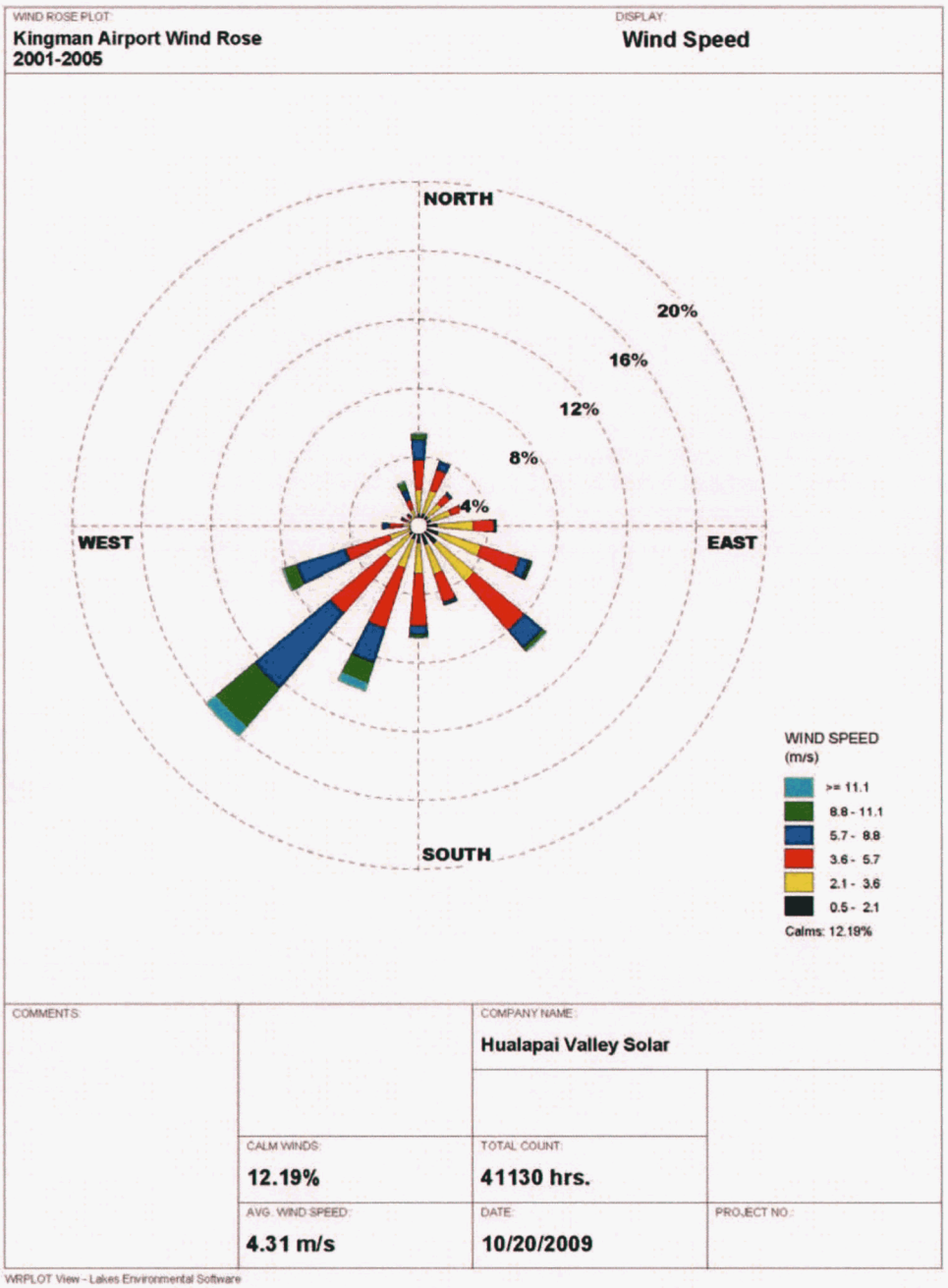

Figure 1 Wind Rose From Kingman Airport Station (2001-2005)

EMISSIONS

Project Air Pollutant Emission Sources

Air pollutant emission sources at the Project during operations will include:

- Emergency Generators
- Cooling Towers
- HTF Processing Emissions
- HTF Heaters
- Auxiliary Heater
- Diesel Fuel Station
- Unpaved Road Traffic
- Paved Road Traffic
- Salt Melter (construction use only)

Emergency Generators

During normal operation, station service power is provided from the generation by the solar project or by the transmission system (back fed through the transformer to the plant electrical system). Diesel emergency powered generators and designated uninterrupted power supplies (UPS) will be required for safe shutdown of the solar field in case of an area wide blackout that would remove the primary electricity source to the Facility. These generators will comply with the most recent New Source Performance Standards for internal combustion engines that apply for stationary sources. The engines will be tested regularly to ensure proper operation. Annual Emissions from the emergency generators are based upon 500 operating hours. Actual emissions will be much less as power outages should be much less (i.e. less than 100 hours).

Cooling Towers

Recirculating water will be used to cool steam exiting the generators and allow it to condense back into water, which is then recirculated through the steam cycle. Cooling towers will be used to cool the recirculating cooling water. A small percentage of the circulating water (0.001%) flow will be lost as "drift" in the cooling towers. This drift will contain dissolved solids, which then form particulate matter.

HTF Processing Emissions

During operations, the HTF will degrade over time into components that have high and low boiling points. Those components are captured as vapors within the HTF system and either condensed, and re-injected back into the closed HTF loop, or removed for off site treatment. Treatment of the vapors will result in some volatile organic compound emissions.

HTF Heaters and Auxiliary Heater

The HTF Heaters and Auxiliary Heater will be fired with No. 2 fuel oil. The HTF Heaters will be used to heat the Heat Transfer Fluid (HTF) to prevent it from freezing, or to allow for electricity

generation on overcast days in order to meet contractual demands. Although the emissions from the HTF heaters may be high on an hourly basis, they will be used less than 250 hours/year. The Auxiliary Heater will be used nightly to produce "seal steam" for the steam generators to prevent gaskets and seals from drying out.

Salt Melter

The Salt Melter will only be used during construction to melt the salts for use in the thermal energy storage tanks. The Salt Melter will be removed before the plant is operational; therefore it is segregated in the tables below.

Diesel Fuel Station

The Diesel Fuel Station will provide fuel for all plant vehicles.

Paved and Unpaved Road Traffic

Emissions from Unpaved and Paved Road Traffic are generated when vehicles travelling along the road surface generate dust from the road surface. Commonly used roads, such as the main entrance and parking lot, will be paved; however, maintenance vehicles must regularly travel into the solar field to clean the mirrors, and these areas will not be paved. However, these vehicles will move very slowly, both because of the technology that will be used to clean the mirrors and to minimize generation of dust (which would negate the mirror cleaning activity).

Tables 2 and 3 report the estimated emissions for pollutants of interest. Carbon dioxide (CO_2) is currently not regulated as a pollutant, but may be in the future.

TABLE 2
Hourly Emission Rates

Pollutant	Hourly Emission Rates (lb/hr)								
	Emergency Generators	Cooling Towers	HTF Pro. Emissions	HTF Heaters	Auxiliary Heater	Fuel Station	Road Traffic	Total	Salt Melter
CO	87.96	-	-	27.67	0.386	-	-	116.0	1.25
NOx	160.9	-	-	110.7	1.54	-	-	273.1	4.98
SOx	0.17	-	-	380	5.3	-	-	385.5	8.53
VOC	10.78	-	TBD	1.88	0.03	0.001	-	12.7	0.09
PM 10	5.03	4.84	-	5.54	0.075	-	2.97	13.43	0.25
PM 2.5	5.03	4.84	-	1.33	0.02	-	0.43	6.62	0.06
HAPs	0.16	-	TBD	0.27	0.004	0.0002	-	0.45	0.01
CO2	17580	-	-	123,400	1720	-	-	142700	5550

TBD = To Be Determined

TABLE 3 Annual Emission Rates									
	Annual Emission Rates (tpy)								
Pollutant	Emergency Generators	Cooling Towers	HTF Pro. Emissions	HTF Heaters	Auxiliary Heater	Fuel Station	Road Traffic	Total	Salt Melter
CO	21.99	-	-	3.459	0.90	-	-	26.35	2.32
NOx	40.21	-	-	13.84	3.60	-	-	57.65	9.27
SOx	0.04	-	-	47.4	12.5	-	-	59.9	15.86
VOC	2.70	-	TBD	0.24	0.06	0.006	-	3.00	0.158
PM 10	1.26	13.1	-	0.69	0.18	-	13.0	28.23	0.463
PM 2.5	1.26	13.1	-	0.166	0.04	-	1.88	16.45	0.111
HAPs	0.04	-	TBD	0.03	0.009	0.0008	-	0.11	0.02
CO2	4395	-	-	15430	4011	-	-	23840	10325
TBD = To Be Determined									

Hazardous Air Pollutants (HAPs)

Emissions of HAPs will be very small. The largest source of HAP emissions will result from processing the low boiling HTF components. Other sources of HAPs include the Emergency Generator, HTF Heaters, Auxiliary Heater, Salt Melter, and Diesel Fuel Station.

CONCLUSION

The Hualapai Valley Solar Power Plant will operate in compliance with State of Arizona and federal air quality rules. ADEQ has been delegated the authority to evaluate and issue air quality permits only to sources that comply with such rules.

As stated in Arizona Administrative Code R14-3-219:

> *"Describe any areas in the vicinity of the proposed site or route which are unique because of biological wealth or because they are habitats for rare and endangered species. Describe the biological wealth or species involved and state effects, if any, the proposed facilities will have thereon."*

Protected of Special Status Species

Study Methods

The U.S. Fish and Wildlife Service (USFWS) Arizona Ecological Services website was accessed to assemble a list of species protected under the Endangered Species Act (ESA) for Mohave County. Habitat requirements of these species and their known range were compiled. The Project area was also analyzed using the Arizona Game and Fish Department's (AGFD) Environmental Review On-line Tool. In addition, the Project area was also examined to determine if any designated critical habitat was present.

Biologists performed a reconnaissance level survey in April 2009 to document vegetation and wildlife habitat of the Project area. In addition, biologists have conducted field assessments as recently as November 2009.

Endangered Species Act Protected Species

Species listed under the ESA as threatened, endangered, proposed, candidate, or conservation agreement occurring in Mohave County are discussed in this Exhibit.

The majority of sensitive species were evaluated and eliminated from further review based on the following criteria:

- The species' known geographic range does not extend to within the Project area
- The Project area does not contain necessary conditions known to support the species
- Project implementation would not remove or adversely affect habitat of the species

Table C-1 contains species listed under the ESA for Mohave County and the Wildlife Species of Concern identified using the AGFD's Environmental Review On-line Tool.

TABLE C-1 Habitat Suitability Assessment for Federally Listed Species in Mohave County			
Species	**Status**	**Suitable Habitat**	**Rationale of Habitat Assessment**
Holmgren milk vetch *Astragalus holmgreniorum*	E	No	This perennial herbaceous plant blooms in spring and is located on shallow, sparsely vegetated soils. It occurs under limestone ridges and along draws in gravelly clay hills at elevation ranging from 2,700 to 2,800 ft. The limestone and hill features associated with this species are not found in the Project area.
Western yellow-billed cuckoo *Coccyzus americanus*	C	No	This species is mainly found among streamside cottonwoods-willow galleries, salt cedar and to a lesser extent larger mesquite bosques. Dense understory vegetation appears to be an important habitat component. It is found in southern, central, and extreme northeastern Arizona. The riparian habitat associated with this species is not found in the Project area.
Jones cycladenia *Cycladenia humilis jonesii*	T	No	This perennial herb inhabits mixed desert scrub, juniper or wild buckwheat-mormon tea habitat. It is found on gypsiferous and saline soils at elevation ranging from 4,390 to 6,000 ft. The Project occurs outside of the known range for this species and is lower in elevation than the elevation at which the species occurs.
Southwestern willow flycatcher *Empidonax traillii extimus*	E	No	This species occurs and breeds at elevations less than 8,500 feet in dense riparian habitats composed of cottonwood, willow, box elder, Russian olive, buttonbrush, arrowweed and tamarisk communities. The species constructs nests in dense thickets. An important habitat component is the presence of water during mid-summer months. The riparian habitat associated with this species is not found in the Project area.
Humpback chub *Gila cypha*	E	No	This species inhabits a variety of riverine habitats, especially canyon areas with fast currents, deep pools, and boulder habitat located below 4,000 ft in elevation. The aquatic features associated with this species are not found in the Project area.
Bonytail chub *Gila elegans*	E	No	The last natural populations exist within Lake Mohave. The species has been introduced into Lake Havasu. Individuals may exist as far downriver as Parker Dam. This species occupies mainstream habitats of slow moving water (eddies, pools, side channels, and coves). Critical habitat is designated on the Colorado River from Hoover Dam to Davis Dam and from the northern boundary of the Havasu National Wildlife Refuge to Parker Dam. The aquatic habitat known to support the species is not present in the Project area.
Roundtail chub *Gila robusta*	C	No	The species is found in several larger rivers and tributaries in the Colorado River Basin. In Arizona, it can be found in the Salt, Bill Williams, Verde, Little Colorado, Aravaipa and Eagle Creek, and tributaries thereof. The aquatic habitats associated with this species are not found in the Project area.

TABLE C-1
Habitat Suitability Assessment for Federally Listed Species in Mohave County

Species	Status	Suitable Habitat	Rationale of Habitat Assessment
Virgin River chub *Gila seminude*	E	No	This species inhabits deep swift waters but not turbulent water. It occurs over sand and gravel with boulders or other instream cover, located at elevation below 4,500 ft. It is currently found in the Moapa River and mainstream Virgin River. The Project is not located near the Moapa or Virgin rivers.
Desert tortoise, Mohave population *Gopherus agassizii*	T	No	This species is currently found in the Mohave Desert. It is found exclusively in the cactus, Joshua tree, and shadscale scrubland north and west of the Colorado River. The Project is not located to the north or west of the Colorado River.
California condor *Gymnogyps californianus*	E	Yes	See species analysis following this table.
Bald eagle *Haliaeetus leucocephalus*	T	No	Bald eagles inhabit areas with large trees or cliffs near water (reservoirs, rivers and streams) associated with abundant prey at various elevations. This species occurs throughout Arizona primarily as a winter resident or migrant. Nest locations are generally concentrated along perennial rivers such as the Agua Fria, Bill Williams, Gila, Salt, San Pedro, Verde, etc. and associated reservoirs. The aquatic habitat known to support the species is not present in the Project area.
Virgin spinedace *Lepidomeda mollispinis mollispinis*	CA	No	The Virgin spinedace inhabits small streams located at elevation below 4,500 ft. It prefers cool, clean tributaries and inflow areas at larger streams, and is generally not found in the mainstream of larger streams. It currently occurs in several tributaries of the Virgin River. The Project is not located along the Virgin River.
Relict leopard frog *Lithobates onca*	C	No	This species is found at elevations below 2,000 ft, in permanent streams, springs, and spring-fed wetlands. They prefer relatively open shorelines where dense vegetation does not dominate. They breed in pools or slow moving side areas of streams, with or without emergent vegetation. The aquatic habitats associated with this species are not found in the Project area.
Hualapai Mexican vole *Microtus mexicanus hualpaiensis*	E	No	This species is typically found near water, in grass/forb habitats among ponderosa pines. It is also located in pinyon-juniper and pine oak associations with a variety of shrubs and grasses. It occurs at elevation ranging from 3,500 to 7,000 ft. The woodland habitats associated with this species are not found in the Project area.
Fickeisen pincushion cactus *Pediocactus peeblesianus fickeiseniae*	C	No	This species is found at elevations ranging from 4,000 to 5,000 ft on shallow soils derived from exposed layers of Kaibab limestone. Occurs on canyon margins or well-drained hills of Navajoan Desert or Great Plains grassland. The Project does not occur at the elevations known to support this species.

TABLE C-1 Habitat Suitability Assessment for Federally Listed Species in Mohave County			
Species	**Status**	**Suitable Habitat**	**Rationale of Habitat Assessment**
Siler pincushion cactus *Pediocactus sileri*	T	No	This species is found in desert scrub vegetation, in transitional areas between the Navajo Desert, Sagebrush Desert and Mohave Desert, at elevations ranging from 2,800 and 5,400 ft. It occurs on gypsiferous clay and sandy soils of the Moenkopi formation, on all aspects of the hills and on slopes varying from zero to eighty degrees. It occurs in extreme northern Arizona. Its range extends approximately 22 miles south from the Arizona/Utah border into Mohave County. The Project is not within the known range of this species.
California brown pelican *Pelecanus occidentalis californicus*	PD	No	California brown pelicans nest in coastal areas and islands. They can be seen around lakes and rivers in Arizona, but are uncommon. There are no known breeding pairs in Arizona. Suitable aquatic habitat for this species does not occur within the Project area.
Woundfin *Plagopterus argentissimus*	E	No	The only native woundfin population exists in the Virgin River. Experimental non-essential populations have been designated and introduced into the Hassaympa River. The aquatic habitat associated with this species is not found in the Project area.
Arizona cliffrose *Purshia subintegra*	E	No	Four distinct populations of Arizona cliffrose occur in central Arizona near Bylas; Horseshoe Lake; Burro Creek; and Cotton-wood in the Verde Valley. It grows in white limestone soils derived from tertiary lakebed deposits. The Project is not located near the known localities of the species. There are no white limestone soils present within the Project area to support this species.
Yuma clapper rail *Rallus longirostris yumanensis*	E	No	This species breeds in freshwater marshes and inhabits brackish water marshes and side waters, preferring tall dense cattail and bulrush marshes. The species requires a wet substrate such as a mudflat, sandbar, or slough bottom. They are found along the Colorado River from Lake Mead to Mexico and also found from various wetland and rivers in southwestern Arizona. The marsh habitat associated with this species is not found in the Project area.
Gierisch mallow *Sphaeralcea gierischii*	C	No	This species is found on gypsiferous outcroppings of the Moenkopi and Kaibab formations. It is known from three location in northern Arizona, Black Rock Gulch, the Black Knolls, and Pigeon Canyon. The Project is not located among the Moenkopi or Kaibab formations.
California least tern *Stema antillarun browni*	E	No	Within Arizona, least tern habitats include lakes and rivers where small fish are abundant. They nest on bare or sparsely vegetated flat substrates along lake or river margins. Rarely are they found breeding in Arizona, although migrants are more common. The lakes and rivers associated with this species are not found in the Project area.

TABLE C-1 Habitat Suitability Assessment for Federally Listed Species in Mohave County			
Species	**Status**	**Suitable Habitat**	**Rationale of Habitat Assessment**
Mexican spotted owl *Strix occidentalis lucida*	T	No	The Mexican spotted owl is found in dense multi-storied closed canopy forests with many snags and downed logs as well as canyons. This species is patchily distributed in forested subalpine and montane coniferous forest, statewide. It is found at elevations from 4,100 to 9,000 feet. The vegetation, topography, and elevation suitable for the species does not occur in the Project area.
Razorback sucker *Xyrauchen texanus*	E	No	This species is currently found in Lake Havasu, Lake Mead, and Lake Mohave. The species is found among large rivers and occupies slow backwaters of medium and large streams and river, flooded bottomlands, side channels, and reservoirs. This species may be found in a variety of habitats during the non-breeding season. The aquatic habitat associated with this species is not found in the Project area.

FWS categories: **Endangered (E)**—Taxa in danger of extinction throughout all or a significant portion of its range; **Threatened (T)/Proposed Threatened (PT)**—Taxa likely to become endangered within the foreseeable future throughout all or a significant portion of its range; **Candidate (C)**—Species for which the FWS has sufficient information on biological vulnerability and threats to support proposals to list as Endangered or Threatened. Candidate species, however, are not protected legally because proposed rules have not been issued. **Proposed Delisted (PD)**—Species has been proposed for delisting. **Experimental (EX)**—Species considered to be experimental and non-essential in its designated use areas. **Conservation Agreement (CA)**—Species protected by a Conservation Agreement between FWS and other cooperating agency(ies) [Source: FWS database (http.//ifw2es.fws.gov/EndangeredSpecies/lists/)].

Species Analysis

Based on review of the federally-listed special status species for Mohave County in **Table C-1**, one species, the California condor, has the potential to occur within the Project study area. The California condor and potential Project related impacts are discussed in detail below.

California Condor

Status

The California condor historically inhabited most of the western United States; however currently, natural populations only exist in California, with an experimental population in Arizona. The reintroduction of California condor at the Vermillion Cliffs in Arizona began in 1996. The reintroduction is carried out under a special provision of the ESA which allows for the designation of a "nonessential experimental" population. This provision allows for relaxed protections for an endangered species in a designated area (often

referred to as the 10(j) area) in order to provide more flexibility for management of the reintroduced species. The Arizona non-essential population designated 10(j) area is bounded by I-40 on the south, US 191 on the east, I-70 on the north, and I-15 to US 93 on the west. Within this area, condors are considered a proposed species under the ESA unless it is within National Park System or National Wildlife Refuge System lands, where they are considered as endangered under the ESA. Outside of this 10(j) area, the species receives full protection under the ESA.

Natural History, Distribution, Abundance and Habitat

The California condor is North America's largest flying land bird, measuring up to 47 inches tall and having a wingspan over eight feet. The lifespan of a California condor in the wild is typically between 50 to 60 years. In Arizona, the birds inhabit rocky outcroppings in the Grand Canyon area, at elevations of 2,000 to 6,500 feet. The California condor does not migrate but it can travel up to 100 miles a day scavenging for food. Reproduction does not occur until six to eight years of life, after which eggs are laid every other year. Mating takes place in late fall and early winter. The condor is a scavenger that feeds on the carcasses of large wild and domestic animals (AGFD 2004).

A total of 93 condors have been released into the wild and five have been wild-hatched as part of the Vermillion Cliffs reintroduction program as of the end of the year 2006. Thirty-seven released birds and one wild-hatched condor have died and three were returned to captivity. Reintroduction efforts have been hampered by predation, lead poisonings, condor-human interactions, and shootings (Southwest Condor Review Team 2007).

The Peregrine Fund (TPF) monitors the day to day operations of the reintroduction program. TPF monitors the condor population using GPS tags affixed to condor wings. Data collected from the GPS tags indicate that the core condor use area is the north rim, south rim, and river corridor of the Grand Canyon, Kaibab Plateau, and Kolob region of southern Utah (Southwest Condor Review Team 2007).

Species Assessment

There is low potential of encountering the California condor in the Project area. The condor core use area is limited to the north and south rims of Grand Canyon, the river corridor of the Grand Canyon, the Kaibab Plateau, and the Kolob region of southern Utah (USFWS and California Condor Recovery Team 2007). Although the Project area is within the experimental range of the condor, condors are not known to use the Project area and the area does not offer suitable nesting habitat. The Project area offers only foraging opportunities similar to those throughout the core area. It is unlikely that a condor would be observed in the Project area. In the unlikely event that a condor was encountered during construction or maintenance, impacts would be limited. To ensure impacts to the California condor are avoided, construction crews will be trained in the identification of condors. In the event a condor visits the work site, construction will temporarily cease and the BLM will be contacted for further guidance. Upon completion

of construction activities, the transmission line could pose a risk to the species due to electrocution. The transmission line design will be in accordance with the *Suggested Practices for Avian Protection on Power Lines: State of the Art in 2006* manual (APLIC 2006). However, the large wingspan of the condor is not considered in the design requirements of transmission lines within this manual. Given the presence of existing transmission line in the Project area, this would not be a new threat to the condor.

Within the experimental range the condors are treated as if they are proposed for listing. Thus two provisions of the ESA apply: 7(a)(1), which requires all federal agencies to use their authorities to conserve listed species, and 7(a)(4), which requires federal agencies to informally confer with the USFWS on actions that are likely to jeopardize the continued existence of a proposed species. Therefore, federal agencies must evaluate actions to determine if the actions will jeopardize the continued existence of the California condor. In summary, the proposed Project will not jeopardize the continued existence of the California condor experimental non-essential population because condors are not expected to use the project area.

BLM Sensitive Species

In addition to federally listed species, the BLM maintains a list of sensitive species within Mohave County. The BLM list of sensitive species includes species that are believed to have declining population numbers. The BLM intends to prevent the listing of these species under the ESA. These species and a summary of their potential to be impacted by the Project can be found in **Table C-2**.

The majority of sensitive species were evaluated and eliminated from further review based on the following criteria:

- The species' known geographic range does not extend to within the Project area
- The Project area does not contain necessary conditions known to support the species
- Project implementation would not remove or adversely affect habitat of the species

Table C-2 contains species listed as sensitive by the BLM for Mohave County.

TABLE C-2
Summary of BLM Listed Sensitive Species for Mohave County

Species	Suitable Habitat Present/ Species Affected by Project	Rationale of Habitat Assessment
Northern goshawk *Accipiter gentilis*	No	The northern goshawk prefers mature mountain forests and riparian zone habitats with a high degree of canopy closure. Its nests are constructed in trees in mature forests. The mature forested areas preferred by this species are not found within the Project area.

TABLE C-2 Summary of BLM Listed Sensitive Species for Mohave County		
Species	**Suitable Habitat Present/ Species Affected by Project**	**Rationale of Habitat Assessment**
Gila longfin dace *Agosia chrysogaster chrysogaster*	No	This species is primarily found in the Gila and Bill Williams river drainages, but has also been introduced into the Virgin River basin. The dace occupies a wide range of streams from low desert streams to high mountain streams. The aquatic habitats associated with this species are not found in the Project area.
Beaver dam milkvetch *Astragalus geyeri* var. *triquetrus*	No	This species is known from Sand Hollow Wash, Horsethief Canyon and Beaver Dam Wash. It occurs on small pockets of wind blown sand in washes within the creosote bush scrub series of vegetation. The Project is located outside of known locations of this species.
Aquarius milk-vetch *Astragalus newberryi* var *aquaria*	No	This plant is localized to Burro Creek in Mohave County. It grows within limey clay soils in desert scrub areas that do not contain creosote bush and paloverde. The Project is not located within Burro Creek.
Diamond Butte milkvetch *Astragalus toanus* var. *scidulus*	No	This plant is known only from the base of the Twin Buttes and Diamond Butte in the Hurricane Valley. It grows in mixed desert shrub at the base of cliffs. The Project is not located within Hurricane Valley.
Western burrowing owl *Athene cunicularia hypugaea*	Yes	The burrowing owl is known from many habitat types, and is mainly limited by the openness of the habitat, preferring low vegetation or widely spaced vegetation. This species is known to occur in the Hualapai Valley. See species analysis section following this table.
Ferruginous hawk *Bueto regalis*	No	This hawk is found in open areas, primarily prairies. It nests in tall trees or willows along streams or on steep slopes, in junipers, on cliff ledges, river-cut banks, and hillsides. This species generally avoids areas of intensive agriculture or human activity. The hills and streamside habitat preferred by this species are not found in the Project area.
Swainson's hawk *Buteo swainsoni*	Yes	These hawks require large and open grassland with abundant prey adjacent to suitable nesting sites. They forage mostly in areas including native semi desert grasslands or lightly grazed pastures, alfalfa and other hay crop, and certain grain and row croplands. They nest either in mature riparian forest, lone trees or grove of oaks, other trees in agricultural fields, and mature trees found along roads and washes. They are known to occur within the Hualapai Valley. See species analysis following this table.

TABLE C-2 Summary of BLM Listed Sensitive Species for Mohave County		
Species	**Suitable Habitat Present/ Species Affected by Project**	**Rationale of Habitat Assessment**
Common black-hawk *Buteogallus anthracinus*	No	This hawk occurs in lowland forest, swamps and mangroves. It is found in both moist and arid habitats. It nests in woodlands near water and is often found amongst groups of cottonwoods. They may refurbish and use old nests. The Riparian woodlands preferred by this species are not found in the Project area.
Desert sucker *Catastomus clarki*	No	This species is found in flowing pools and rapids of the Gila River Basin and Bill Williams River tributaries. The aquatic habitat associated with this species is not found in the Project area.
Sonora sucker *Catostomus insignis*	No	This species is common in the Gila and Bill Williams River systems, and less common in the Salt River. It prefers deep, quiet pools. The aquatic habitat associated with this species is not found in the Project area.
Flannelmouth sucker *Catostomus latipinnis*	No	This species occurs within the Colorado River and its larger drainages. Generally, it occurs within large or moderately larger rivers. The aquatic habitat associated with this species is not found in the Project area.
Desert rosy boa *Charina trivirgata gracia*	No	The desert rosy boa is found in rocky areas of desert mountainous areas. It prefers canyon areas with permanent or intermittent streams. The rocky canyons associated with this species are not found in the Project area.
Pale Townsend's big-eared bat *Corynorhinus townsendii pallescens*	Yes	This bat species has summer day roosts sites that are located in caves and mines in a wide range of habitat types. Summer night roosts are often in buildings. Winter hibernation sites are within cold caves, lava tubes, and mines in upland habitats near the Grand Canyon and in southeastern Arizona. See bat discussion following this table.
Silverleaf sunray *Enceliopsis argophylla*	No	In Arizona, this species is known from the Lake Mead Area, Grapevine Mesa, Hurricane Cliffs, south of Hoover Dam, Boulder Dam area, Gyp Hills and east of Littlefields. This species grows on dry slopes and washes in desert scrub communities. The Project is located outside of the known range of this species.
Sticky buckwheat *Eriogonum viscidulum*	No	In Arizona, this species is only known from extreme northwestern Mohave County north of the Virgin River. It grows on low dunes, washes, and sandy areas. The Project is located outside of the known range of this species.

TABLE C-2 Summary of BLM Listed Sensitive Species for Mohave County		
Species	**Suitable Habitat Present/ Species Affected by Project**	**Rationale of Habitat Assessment**
Spotted bat *Euderma maculatum*	Yes	This species is found in various habitats ranging from deserts to forested mountains; they roost and hibernate in caves and rock crevices and are limited to relatively remote and undisturbed areas. This species is nocturnal and feeds primarily on insects. See bat discussion following this table
Greater western bonneted bat *Eumops perotis californicus*	Yes	This bat occurs in arid and semiarid regions often in rocky canyon habitats. It roosts in crevices and shallow caves on the sides of cliffs and rock walls, and occasionally buildings. Roosts are usually high above ground with unobstructed approach. See bat discussion following this table.
American Peregrine falcon *Falco peregrinus anatum*	No	This species is associated with large high cliffs such as the Mogollon Rim, Grand Canyon, and the Colorado Plateau, where sufficient prey and water are available. It is found throughout Arizona. The steep terrain associated with this species is not found in the Project area.
Flannel bush *Fremontodendron californicum*	No	This species prefers dry rocky growing conditions from 6,000-7,000 feet and prefers granite slopes of chaparral, oak and yellow pine woodland, and pinyon-juniper woodland. The granite slopes preferred by this species are not found in the Project area.
Roundtail Chub *Gila robusta*	No	This species is found in warm streams and large tributaries of the Colorado River Basin. They generally prefer cobble-rubble, sand-cobble, or sand-gravel substrate. Large populations often occur in pools behind irrigation diversions. The aquatic habitat associated with this species is not found in the Project area.
Sonoran desert tortoise *Gopheris agassizii*	No	This tortoise species occurs among rocky foothills. It uses large boulders and caliche caves formed in banks of incised washes as shelter sites. The rocky foothills and incised washes associated with this species are not found in the Project area. This species is not expected to occur in the Project area.
Bald Eagle (wintering population) *Haliaeetus leucocephalus*	No	This species prefers areas with large bodies of water and large trees for nesting. They nest in the upper canopy of towering mature trees with open branches or in large stick nests on cliffs near large rivers, lakes, bays, and coastlines. They feed primarily on fish. The aquatic areas associated with this species area not found in the Project area.

TABLE C-2 Summary of BLM Listed Sensitive Species for Mohave County		
Species	**Suitable Habitat Present/ Species Affected by Project**	**Rationale of Habitat Assessment**
Sonoran Desert Bald Eagle *Haliaeetus leucocephalus* pop.3	No	This species consists of the eagle population within the Sonoran Desert. Other characteristic are similar to *Haliaeetus leucocephalus.* The aquatic areas associated with this species area not found in the Project area.
Western red bat *Lasiurus blossevillii*	No	This bat species is found in riparian habitats dominated by cottonwoods, oaks, and sycamores. It is rarely found in desert habitats. Summer roosts are usually in tree foliage. This species tends to avoid roosting in caves and buildings during summer/winter. This species has widely scattered locations in Arizona, but is known from only 15 specimens as of the mid-1980s. No bats have been recorded in Mohave County since 1902. The riparian habitats associated with this species are not found in the Project area.
California black rail *Laterallus jamaicensis coturniculus*	No	This rail most commonly inhabits tidal emergent wetlands dominated by pickleweed, or brackish marshes supporting bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass. It typically occurs in the high wetland zones near the upper limit of tidal flooding and breeds among high coastal marshes in California. Along the Colorado river, prefers dense bulrush stands, shallow water and gently sloping shorelines. The marsh habitats associated with this species are not found in the Project area.
Virgin spinedace *Lepidomeda mollispinis mollispinis*	No	This species is restricted to Virgin River drainage in northwestern Arizona, southeastern Nevada, and southwestern Utah. It is usually associated with clear, cool, relatively swift streams with pools, runs, and riffles. It usually spawns over gravel and sand substrates at the lower ends of pools. The aquatic habitat associated with this species is not found in the Project area.
Northern leopard frog *Lithobates pipiens*	No	This species inhabits springs, slow streams, marshes, bogs, ponds, canals, flood plains, reservoirs, and lakes. It is usually found in permanent water sources with rooted aquatic vegetation. In the summer, commonly inhabits wet meadows and fields. This species usually overwinters underwater. It can be found throughout the Navajo Nation where appropriate habitat is present. The aquatic habitat associated with this species is not found in the Project area.

TABLE C-2 Summary of BLM Listed Sensitive Species for Mohave County		
Species	**Suitable Habitat Present/ Species Affected by Project**	**Rationale of Habitat Assessment**
Lowland leopard frog *Lithobates yavapaiensis*	No	The lowland leopard frog occurred historically from the lower Colorado River east through central Arizona below the Mogollon Rim and southeastern Arizona to New Mexico. The species is now absent from the lower Colorado River and adjacent portions of southeastern California, they are about gone from their limited historical range in New Mexico, and have declined significantly in southeastern Arizona. This frog inhabits big rivers, streams, cattle tanks, agricultural canals and ditches, mine adits, and other aquatic systems from the Yuma Valley at near sea level to almost 6,000 feet, and from Sonoran desert scrub into pinyon-juniper woodland. Lowland leopard frogs do well in unregulated streams that are subject to periodic floods. The aquatic habitat associated with this species is not found in the Project area.
California leaf-nosed bat *Macrotus californicus*	Yes	This bat species roosts in mines, caves, rock structures, and in some manmade structures. It prefers large ceilings along with open flying spaces within roosts. It forages on large flying insects, primarily moths. See bat discussion following this table.
9/11 blazingstar or 9/11 stickleaf *Mentzelia memorabalis*	No	This species is known only from the Clayhole Wash Drainage between Colorado City and Mount Trumball. It grows on dry gypsum-clay outcrops. The Project is not located in the Clayhole Wash area.
Arizona myotis *Myotis occultus*	No	This species of bat is most often found above the Mogollon Rim. It is believed to occur in the lower Colorado River Valley and is found within ponderosa pine, pine-oak woodlands and riparian areas along the Colorado River Valley. It may use caves, old buildings and also timbers of old bridges for roosting. It forages on insects. The riparian or woodland areas associated with this species are not found within the Project area.
Siler pincushion cactus *Pediocactus sileri*	No	This cactus occurs across northern Arizona from the Hurricane Cliffs to near Fredonia. It grows on red gypsiferous badlands from the Moenkopi formation parent material. The gypsiferous substrate preferred by this species is not found in the Project area.
White-margined penstemon *Penstemon albomarginatus*	No	This species is known from the Dutch Flat and Sacramento Valley area. It grows in coarse sandy and silty soils in Mohave desertscrub communities. The Project is not located within the Dutch Flat or Sacramento Valley area.

TABLE C-2 Summary of BLM Listed Sensitive Species for Mohave County		
Species	**Suitable Habitat Present/ Species Affected by Project**	**Rationale of Habitat Assessment**
Cerbat beardtongue *Penstemon bicolor* ssp. *Roseus*	No	In Arizona, this species occurs on the southeastern edge of the Shivwits Plateau. More specifically, it is known from Parashaunt and Andrus canyons. It typically grows in gravelly Kaibab limestone in pinyon-juniper woodlands. The Project is not located in the Parashaunt or Andrus canyon areas.
Mount Trumbull beardtongue *Penstemon distans*	No	This plant is known only from the southeastern edge of the Shivwits Plateau. It grows on gravelly Kaibab limestone on cliff tops and to a lesser extent on north facing canyon slopes of the Supai formation. The Project is not located along the Shiywits Plateau.
Parish's phacelia *Phacelia parishii*	Yes	In Arizona, this species is known from the Hualapai Valley and Burro Creek. It grows on alkaline playas or knolls in the desert, on the edges of dry lakes. See species analysis following this table.
Mohave indigo bush *Psorothamnus arborescens var. pubescens*	No	This species is found in the Colorado River drainage of southern Utah and northern Arizona, within Marble Canyon and the eastern Grand Canyon. It grows in flats and washes ranging from 500 to 3000 feet in elevation. It is often associated with creosote bush scrub. The Project is not located within Marble Canyon or the Grand Canyon.
Grand Wash springsnail *Pyrgulopsis bacchus*	No	This snail is known from three springs (Grapevine, Whiskey and Tassi) in Grand Wash. It is generally found with cattails, sedges, cottonwood, willow, ash, or mesquite vegetation. The Project is not located within Grand Wash.
Kingman springsnail *Pyrgulopsis conica*	No	This snail is known from three springs (Burns, Dripping and Cool) in the Black Mountains. The Project is not located within the Black Mountains
Desert springsnail *Pyrgulopsis deserta*	No	This species is found within springs along the Virgin River in Utah and Arizona. The Project is not located along the Virgin River.
Speckled dace *Rhinichthys osculus*	No	This fish is found in the running waters of shallow creeks, and small to medium rivers with riffles, runs and headwater pools. The aquatic habitat associated with this species is not found in the Project area.
Grand Canyon rose *Rosa stellata ssp. Abyssa*	No	This plant is known from both rims of the Grand Canyon (mainly north rim), Kanab Canyon and the junction of the Little Colorado River with Big Canyon. The species is found near canyon rims or on the edges of plateaus and occurs on red-limestone soils. The Project area does not include red-limestone soils; the Project is located outside the known range of this species.

TABLE C-2 Summary of BLM Listed Sensitive Species for Mohave County		
Species	**Suitable Habitat Present/ Species Affected by Project**	**Rationale of Habitat Assessment**
Aravaipa wood fern *Thelypteris puberula var. sonorensis*	No	This plant requires moist riparian habitat. It is often found in canyons, on riverbanks and next to seepages. It always grows in the shade of boulders. The riparian habitat associated with this species is not found in the Project area.

BLM Sensitive Species Analysis

One BLM-sensitive plant, Parish's phacelia (*Phacelia parishii*), two BLM-sensitive birds, the western burrowing owl (*Athene cunicularia hypugaea*) and Swainson's hawk (*Buteo swainsoni*), and four BLM-sensitive bats, the California leaf-nosed bat (*Macrotus californicus*), greater western bonneted bat (*Eumops perotis californicus*), pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), and spotted bat (*Euderma maculatum*) have the potential to occur within the Project area. Potential impacts to these species are discussed in this section. Bat species are dealt with as a group to prevent redundancy, as potential impacts to all bat species that potentially occur in the Project area are similar.

Parish's Phacelia

Species Information

Parish's phacelia is listed as a BLM species of concern. It is a low-growing annual herb found among desert alkaline playa or knolls, or along dry lake beds. In Arizona, it can be found in the Hualapai Valley and at one location along Burro Creek. The global short-term trend of the species appears to be declining (AZGFD 2005).

Potential Impacts

There is potential to encounter Parish's phacelia throughout the Project area. This species was not identified during biological reviews conducted by Tierra. However, this species is believed to be present in the general Project area. Impacts to this species could arise thought the destruction of individual plants during construction, and permanent loss of habitat associated with Project facilities. The BLM is being consulted regarding appropriate mitigation for impacts to this species should it be found on the Project site.

Burrowing Owl

Species Information

The western burrowing owl is listed as a BLM species of concern and is additionally protected by the Migratory Bird Treaty Act. It is a small, ground-dwelling owl often occurring in colonies. It inhabits open areas such as grasslands, edges of agricultural fields, sparse desert scrub, golf courses, cemeteries, airports, and vacant lots. The presence of burrows is a critical habitat requirement because the owls nest in burrows, but they do not excavate their own burrows. They are dependent upon other species to construct burrows. In Arizona, burrowing owls are often found in areas that support prairie dog (*Cynomys gunnisoni*) and round-tailed ground squirrel (*Spermophilus tereticaudus)* populations (deVos 1998, Brown 2001). These burrowing mammals usually occupy open environments, construct burrows, and maintain vegetation at a short height, all of which suit the burrowing owl (deVos 1998).

Burrowing owl diets may include numerous prey items including rodents, small birds, frogs, invertebrates, and carrion. In Arizona, predominant prey items discovered in pellets from burrowing owls were scorpions, beetles, locusts, and small rodents (Haug et al. 1993). Additionally, Estabrook and Mannan (1998) found signs of mourning doves in the diet of burrowing owls in an urban setting.

Potential Impacts

There is potential to encounter burrowing owls in the Project area since burrowing owls are known to occur in the vicinity of the Project area. Potential impacts from Project activities include increased potential for a strike and/or mortality resulting from construction traffic, potential entrapment within burrows (partial burrow collapse), and modification to feeding or reproductive behavior due to elevated disturbance levels (e.g., human presence, elevated noise, ground vibration levels). These impacts would be limited to the period of construction. Permanent impacts would occur due to the permanent loss of habitat. To minimize impacts to this species a pre-construction survey would be performed. Owls that are found in harm's way would be relocated to suitable offsite locations.

Swainson's Hawk

Species Information

The Swainson's Hawk is listed as a BLM species of concern and is additionally protected by the Migratory Bird Treaty Act. Swainson's hawks require large open grasslands with suitable nest trees and abundant prey. Foraging occurs among native grasslands, lightly grazed pastures, alfalfa and other hay crop fields, and grain and row crops (CDFG 2005). Vineyards, orchards, rice fields, corn and cotton fields do not provide suitable foraging habitat (CDFG 2005). The hawk does occupy semi-desert grasslands and is known to occur in the Hualapai Valley. Swainson's hawks nest in

large mature trees generally within riparian areas but may use solitary trees in open areas. The nesting period is generally from March 1 to August 31 (USFWS 1999).

Potential Impacts

A Swainson's hawk was observed within the Project area by Tierra biologists. Impacts to Swainson's hawk could occur from the permanent loss of foraging habitat to solar facilities. Additional impacts could arise from disturbance to feeding habits during construction. Although no natural nest substrates are located within the Project area (i.e. large trees), nests could occur on transmission line structures near the Project area, creating the potential for disturbance of breeding habits during construction. To minimize impacts, a pre-construction bird breeding survey will be conducted if construction occurs during the avian breeding season (March 1 through August 31). If Swainson's hawk nests are found, a spatial buffer of 0.5 miles will be placed around the nest to minimize construction impacts to breeding birds until the young have fledged and are foraging on their own, or wildlife biologists monitoring construction activities within the 0.5 mile determine the nesting hawks are not being adversely impacted by construction activities.

Bats

Bat Information

Four BLM sensitive species of bat, the California leaf-nosed bat greater western bonneted bat, pale Townsend's big-eared bat, and spotted bat have the potential to occur in the Project area. All of these species roost or hibernate in caves and crevices, which are not located in the Project area. However, suitable roosting habitat is found in the mountainous areas surrounding the Hualapai Valley, and the Project area could be used as foraging habitat for these bats.

Potential Impacts

No impacts to roost sites are anticipated as a result of the Project, as no suitable roosting habitat is located in the Project area. Impacts could result from the conversion of desert habitat to a solar facility. This may alter the foraging behavior of local bat species. Additionally, evaporation ponds on the Project site could present a hazard to bats if they drink from them, as the ponds may have an increased concentration of minerals.

Tribal Sensitive Species

The Hualapai Tribe expressed interest in a plant species potentially occurring in the Project area. The plant species is whitestem blazing star (*Mentzelia albicaulis*), which is a common annual species growing throughout the Western United States. The Hualapai collected the seeds and used it as a food source. The plant was widespread in the Hualapai Valley in the past, but is believed to be mostly absent today. The

Project proponent is working with the Tribe to identify if the plant still exists within the Project area.

Migratory Bird Treaty Act

With the exception of domestic pigeons, house sparrows, and European starlings, all birds in the Project vicinity are protected under the Migratory Bird Treaty Act of 1918, as amended (16 USC 703-712). The Migratory Bird Treaty Act states it is unlawful to take, kill, or possess migratory birds that are listed under its protection. Construction activities occurring during the breeding season (March 1st to October 15th) could potentially impact migratory birds through direct or indirect take resulting from nest destruction or abandonment.

To minimize impacts to migratory birds, a preconstruction survey to identify active bird nests will be conducted if construction occurs during the breeding season. Species specific spatial buffers will be employed to avoid disturbing nesting birds.

Arizona State Native Protected Plants

Several plants with protection under the Arizona Native Plant Law have the potential to occur in the Project area. No Highly Safeguarded plants (no collection allowed) as classified under the Arizona Native Plant Law (ARS § 3-904) are known to exist in the Project area. All cactus species located in Project area (cholla, barrel, pincushion, etc.) are considered Salvage Restricted, which prohibits collection without a permit. No other Arizona-protected plants are anticipated to occur in the Project area.

Noxious Weeds

Noxious weeds are non-native or invasive pests that grow and spread rapidly and out-compete native species. The BLM maintains a national noxious weeds list. Additionally, the Arizona Department of Agriculture has compiled an "Arizona Noxious Weed List" and the Arizona Department of Transportation also has a list of noxious weeds. No noxious weeds were identified during field reviews of the Project area. Conservation measures such as washing construction equipment prior to entering the work site would reduce the spread of noxious weeds.

Conservation Measures

The following conservation measures are proposed to minimize impacts to listed or sensitive species:

General Conservation Measures

- Prior to the commencement of construction activities, a worker education program will be conducted to inform workers of sensitive species with potential to occur in the Project area and the measures required to minimize impacts to the species.

- No pets or firearms will be allowed on the construction site.
- The design of the power line will be in compliance with current standards and practices that reduce the potential for raptor fatalities and injuries. The commonly referenced source of such practices is found within the *Suggested Practices for Avian Protection on Power Lines: State of the Art in 2006* manual (APLIC 2006).
- To avoid unnecessary disturbance, construction activities should use access roads where feasible, and travel off of access roads should be limited to the minimum necessary to complete construction activities.
- HVS will obtain the necessary permits from the Arizona Department of Agriculture for the destruction of plants protected under the Arizona Native Plant Law prior to construction.
- All trash will be disposed of in proper containers and removed from the work site at the end of each day or contained in a trash container with a secure lid.
- Comply with the regulatory provisions of the Migratory Bird Treaty Act and ESA.

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As stated in Arizona Administrative Code R14-3-219:

> *"List the fish, wildlife, plant life and associated forms of life in the vicinity of the proposed site or route and describe the effects, if any, the proposed facilities will have thereon."*

Existing Conditions

The Project is in an undeveloped area adjacent to the Red Lake Playa. Existing fish, wildlife, and plant life are listed below.

Plant Life

Vegetative communities within the Project area consist of Mohave desertscrub and semidesert grassland (Brown 1994). Vegetation typical of these communities is described below. Vegetation observed during biological surveys conducted in 2009 is provided in **Table D-1.**

Mohave Desertscrub
Vegetation typical of the Mohave desertscrub community include creosotebush (*Larrea tridentata*), all-scale (*Atriplex polycarpa*), brittlebush (*Encelia farinose*), desert holly (*Atriplex hymenelytra*), and white burrobush (*Hymenoclea*) (Brown 1994).

Semidesert Grassland
Vegetation in semidesert grasslands can include a variety of perennial grass species, however, it is often characterized by the dominance of tobosa grass (*Hilaria mutica*) or black grama (*Bouteloua chondrosiodes*) (Brown 1994).

The majority of the Project area is in a transitional zone between Mohave desertscrub and semidesert grassland. Vegetative characteristics of both communities are present, and are locally dominated by fiddleneck (*Amsinckia spp.*) (Tierra 2009). The Project area does not occur within Red Lake Playa, although it is adjacent to the dry lake bed. Playas tend to be unvegetated or vegetated only by salt-tolerant plants, such as shadscale saltbrush (*Atriplex confertifolia*). Little to no vegetation is present at Red Lake Playa (Tierra 2009).

The Project would result in the removal of over 4,000 acres of vegetation. This vegetation would be permanently removed to build Project facilities. Vegetation in the Project area has been previously impacted by grazing and construction of the existing electrical transmission lines, but otherwise has been mostly undeveloped. Adjacent lands and much of the Hualapai Valley is largely undeveloped and contains similar vegetation.

Table D-1 Vegetation Observed		
Scientific Name	**Common Name**	**Vegetation Community**
Agave schottii	Schott Agave	Semidesert Grassland
Ambrosia dumosa	White Bursage Mohave	Desertscrub
Artemisia spp.	Sagebrush	Semidesert Grassland
Artemisia tridentata	Big Sagebrush	Mohave Desertscrub
Artiplex canescens	Fourwing Saltbush	Mohave Desertscrub
Artiplex confertifolia	Shadscale	Mohave Desertscrub
Artiplex hymenelytra	Desert Holly	Mohave Desertscrub
Artiplex polycarpa	All-scale	Mohave Desertscrub
Bouteloua eripoda	Black Grama	Semidesert Grassland
Bouteloua filiformis	Slender Grama	Semidesert Grassland
Bouteloua gracilis	Blue Grama	Semidesert Grassland
Bromus rubens	Red Brome	Semidesert Grassland
Buchloe dactyloides	Buffalo Grass	Semidesert Grassland
Calliandra eriophylla	False Mesquite	Semidesert Grassland
Canotia holacantha	Crucifixion Thorn	Semidesert Grassland
Celtis	Hackberry	Semidesert Grassland
Chilopsis linearis	Desert Willow	Semidesert Grassland
Encelia farnosa	White Brittlebrush	Mohave Desertscrub
Eriogonum spp.	Buckwheat	Semidesert Grassland
Fouquieria splendens	Ocotillo	Semidesert Grassland
Hilaria rigida	Big Galleta	Mohave Desertscrub
Hymenoclea salsola	Cheesebrush	Mohave Desertscrub
Isocoma heterophylla	Jimmyweed	Semidesert Grassland
Isocoma tenuisecta	Burroweed	Semidesert Grassland
Larrea tridentate	Creosote Bush	Semidesert Grassland
Opuntia echinoocarpa	Silver Cholla	Mohave Desertscrub
Opuntia erinacea	Mohave Prickly Pear	Mohave Desertscrub
Opuntia phaecantha	Engelmann Prickly Pear	Semidesert Grassland
Prosopis juliflora	Mesquite	Semidesert Grassland
Rhus microphylla	Littleleaf Sumac	Semidesert Grassland
Salvia monhavensis	Mohave Sage	Mohave Desertscrub
Sarcobatus vermiculatus	Black Greasewood	Mohave Desertscrub
Scleropogon brevifolius	Burrograss	Semidesert Grassland
Setaria spp.	Bristlegrass	Semidesert Grassland
Yucca elata	Soaptree Yucca	Semidesert Grassland
Zizyphuso btusifolia	Graythorn	Semidesert Grassland

Fish

There are no waters that would support fish within the Project area. Impacts to fish are not anticipated.

Wildlife

Wildlife in the Project area is typical of Mohave desertscrub and semidesert grassland communities of Northwest Arizona. Species in these communities commonly include whiptail lizards (*Cnemidophorus spp.*), Mojave rattlesnake (*Crotalus scutulatus*),

mourning dove (*Zenaida macroura*), coyote (*Canis latrans*), kangaroo rats (*Dipodomys spp.*), and black –tailed jackrabbit (*Lepus californicus*). Species observed by Tierra were limited to the Swainson's hawk (*Buteo swainsoni*), turkey vulture (*Cathartes aura*), American Crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), American Kestrel (*Falco sparverius*), loggerhead shrike (*Lanius ludovicianus*), Violet-green Sparrow *(Tachycineta thalassina)*, and black-tailed jackrabbit (*Lepus californicus*).

Construction and operation of the Project will result in loss of habitat for many of these species. Additional impacts could occur from the construction and operation traffic, resulting in an increased probability for strikes to wildlife in the area.

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EXHIBIT E: SCENIC AREAS, HISTORIC SITES AND STRUCTURES, ARCHAEOLOGICAL SITES

As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

> *"Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon.."*

Visual Resources

The Project is located approximately 27 miles north of Kingman and 20 miles east of U.S. Highway 93 within an undeveloped area of Mohave County. The Project is located on private and federal land under the jurisdiction of the Bureau of Land Management (BLM). Further, the Project is located within the Hualapai Valley, on the valley floor, between the Grand Wash cliffs on the East, and the Cerbat Mountains on the west. The Hualapai Valley, including Red Lake, is considered an important area to local Native American groups, including the Hualapai Tribe.

The Project area is on the valley floor and flat, adjacent to a large desert playa. Vegetation is sparse and consists of low growing grasses and shrubs. The valley extends broadly to the north and south and is bound on the west by the Cerbat Mountains. To the east, the landscape rises dramatically to form the Grand Wash Cliffs and the Music Mountains.

The Project area and the surrounding area are open and undeveloped. The nearest major roads are Stockton Hill Road to the west and Antares Road to the east of the Project. County Highway 25 and Historic Route 66 are located to the north and south of the Project, respectively. Two existing 500kV and one existing 345kV electrical transmission lines cross the valley, generally in an east-west direction in the vicinity of the Project. A few scattered ranching residences are located in the vicinity of the Project area and the only major land use is grazing. The nearest residential subdivisions are distant (more than 10 miles), located in Dolan Springs to the northwest, and Valle Vista to the south.

Designated scenic resources in the vicinity of the Project include Historic Route 66 as well as the Mount Tipton Wilderness Area. Route 66, located 15 miles south of the Project, is designated under the federal National Scenic Byways Program as an All-American Road. The Mount Tipton Wilderness Area is seven miles to the west and managed by the BLM to preserve the existing landscape.

The Gen-Tie proposed as part of the Project crosses land managed by the BLM. The BLM uses the Visual Resource Management (VRM) system to classify the

aesthetic quality of an area and determine management objectives. The Project is located within a Class IV area, which according to the VRM system, allows activities that lead to significant modification of the existing character of the landscape. The level of change may be high, and contrasts may attract attention and are likely to be a visible feature of the landscape (BLM 2009).

Viewers relevant to the Project include nearby residents (about 2.5 miles), travelers along major and minor local roads, recreation users, as well as members of the Hualapai Tribe.

Potential viewing areas within the vicinity of the Project include views from nearby residences; views along Stockton Hill Road; distant views from County Road 25; distant views from Historic Route 66; distant views from the Valle Vista subdivision; distant views from the Cerbat Mountains; and views from areas identified as culturally important to the Hualapai Tribe. Visual simulations were prepared depicting the Project at various locations and are included as **Exhibit G**.

~~Those with the closest and most prolonged views of the Project will be the~~ residents that live within several miles of the Project. Several of the nearby residences are nestled behind hills and up canyons and will not have direct views of the Project.

The majority of the viewers will be travelers on Stockton Hill Road, Historic Route 66, and County Highway 25. Views along these routes are of the surrounding Grand Wash Cliffs and Cerbat Mountains. These views will not be blocked by the Project and views of the Project are distant and fleeting.

Recreation users in the Cerbat Mountains as well as members of the Hualapai Tribe in the Music Mountains will view the Project occasionally. Viewers in these areas expect a more natural landscape. Views of the Project are distant and interrupted by vegetation and topography. The Project will not block views of adjacent areas from the Cerbat Mountains or the Music Mountains.

Scoping and tribal consultation activities have identified that the Hualapai Tribe is interested in the visual setting and has contributed to the selection of key observation points where visual analysis and visual simulations will be performed.

The visual resource evaluation involved comparing the expected visual change in the existing setting, as observed at locations where viewers will likely see the Project most frequently or for sustained periods. Specifically, the evaluation examined the contrast the Project will have on the existing visual elements in context to the management program for the area. Visual elements consider the contrast in the proposed condition with the existing design elements of form, line, color, and texture. The introduction of some features will be a contrast, especially

for the Power Block. However, Gen-Tie will interconnect with existing lines and contrast is expected to be minor because of the presence and dominance of the existing lines in the landscape. The scenic value is also factored into the analysis and as previously mentioned the management strategy for public lands in this area rated it the most suitable area for major contrast and modification. The Project will be visible from several important viewing locations, but will not block important views of the surrounding area. The results of the analysis revealed that the level of change to the characteristic landscape will be minimal for all Project features.

References

BLM Visual Resource Management Manual 8410

Cultural and Historic Resources

Introduction

Western Area Power Administration (Western) is the lead agency for the Federal process. Western is reviewing a Class I Cultural Resource Report (Mitchell 2009) and has contracted with the Hualapai Tribe Cultural Resources Group to conduct a Class III pedestrian survey of the entire Project area. Western has initiated consultation with the BLM, Kingman Field Office and with appropriate regional tribes.

Regulatory Context

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effect of actions, including the operation and maintenance of public utilities, on Historic Properties that may be present. The State Office of Historic Preservation and the Advisory Council on Historic Preservation are provided with reasonable opportunity to comment on the Project.

Western is responsible for ensuring that potential adverse environmental effects are avoided or minimized. Western will consult with the BLM, Kingman Field Office, which has jurisdiction over some of the land within the Project area. A cultural resource survey and resulting report will be completed to assist Western in this task and will be conducted in compliance with Section 106 of the NHPA

Cultural Setting

Paleoindian Period

Human occupation of the project area extends back at least 12 millennia or more when small bands of mobile hunters moved about open juniper and scrub oak woodlands (Stone 1991). Evidence of this Paleoindian Period is rare but a number of sites have been tentatively assigned to the San Dieguito complex (Hayden 1976; Huckell 1998; Rogers 1958). This complex has also been called the Lake Mohave (Warren and Crabtree 1986) and Playa complexes (Gallegos 1980). Four stages have been identified: Malpais, San Dieguito I, San Dieguito II, and San Dieguito III (Hayden 1976). The oldest of these, the Malpais, constitutes a lithic technology that includes unifacial chopper scrapers, scrapers, and spokeshaves, tools that were probably used for woodworking. There was also a well-developed shell tool industry that included knives, scrapers, and gouges. Features found at Malpais sites include sleeping circles, trails, shrines, and geometric intaglios (Hayden 1976).

As with most sites in western Arizona, dating Malpais sites is problematic. Malpais artifacts are dated mainly by the degree of patination they exhibit.

Artifacts are often assigned to this stage when they exhibit a heavy "liquid" varnish and are partially embedded within old desert pavement (Dorn et al. 1992; McGuire 1982:161). Hayden (1976) proposed that desert varnish only occurs during periods of extreme aridity and suggested these represent a pre-Clovis, pre-Paleoindian technology that may date to as early as 30,000 to 40,000 B.C. However, desert varnish formation rates are not well understood (Mabbutt 1977; Thomas 1989). While most archaeologists are willing to agree that these are the region's oldest sites, they reject Hayden's dates, suggesting that dates in the range of 15,000 to 10,000 B.C. are more likely (Mabry 1998). The absence of Malpais artifacts from stratified or chronometrically dated contexts complicates this issue.

Hayden (1976) identified subsequent stages partially on the basis of a less well-developed artifact patination. The San Dieguito II is also characterized by the development and widespread use of bifacial flaking technology, although unifacial flaking continues to be common. San Dieguito II does not appear to occur within western Arizona.

Archaic Period

The Archaic Period follows the Paleoindian Period. In western Arizona, this is usually confined to the Amargosan culture sequence, originally defined by Rogers (1939), but also referred to as the Pinto (5,000 to 2000 B.C.) and Gypsum (2000 B.C. to A.D. 500) periods (Warren and Crabtree 1986). As with the earlier occupations of the region, no consensus exists as to the dating of the sequence. Rosenthal, et al. (1978:19) placed the beginning of Amargosa I at 4000 B.C. However, Bruder and Spain (1986:3) place it at around 7500 B.C. To complicate the issue, Hayden (1976) suggests that the Sonoran Desert in Arizona was abandoned between 7000 and 3000 B.C.

Confusion continues for the dating of the Amargosa II stage. Bruder and Spain (1986:3) place it between 1500 and 350 B.C., Hayden (1976) has it ending at around 1000 B.C., and Rosenthal, et al. (1978:19) have it lasting, in some locations, until A.D. 800. The stage is characterized by the appearance of metates and mortars, at least in Arizona (Rogers 1958), and changes in projectile point styles. A short, triangular, corner-notched point appears during this stage, similar to those of the Chiricahua stage Cochise culture. The Amargosa III stage, the final preceramic period in western Arizona, is characterized by an increasing dependence on groundstone, horseshoe-shaped stone windbreaks (Bruder and Spain 1986:56), and an absence of patination on flaked stone artifacts (Hayden 1967:339). Projectile points appear similar to those of the San Pedro Cochise. Although Amargosa III is generally considered preceramic, Hayden (1967:339) reports an association of Amargosa III materials with brownware pottery across portions of southern Arizona. It is possible that unidentified riverine horticulture occurred in western Arizona during this stage.

Formative Period

The Formative period is identified in western Arizona by a number of important changes. First, pottery made its initial appearance along the Colorado River. Second, smaller projectile points, indicative of the use of bows and arrows, replaced atlatl darts. Together, these suggest a more sedentary lifestyle and at least a partial reliance on domestic crops. Little is known of this time period compared to Arizona's other Formative cultures. This is due to a combination of research projects being mostly small and few and because of the lack of complex or stratified sites.

Non-compatible chronologies include one by Rogers (1945) based on ceramic vessel morphology and surface treatment and another by Schroeder (1952, 1958) based on temper. Further revisions by Huckell (1979) and Waters (1982), which mostly support Rogers' (1945) scheme, identify three Formative Period phases: Patayan I, Patayan II, and Patayan III. While the term Patayan has traditionally been used by archaeologists, some tribal communities prefer the term "Pre-Yuman."

Sites in Arizona attributed to Patayan I are typically found along the Colorado River south of the Bill Williams River and have been dated to between A.D. 700 and 1000. Trade items from both the Hohokam region to the east and the Pacific Coast to the west have been identified at these sites. Associated features found in upland locations include small lithic assemblages, geoglyphs, sleeping circles, and trails (Stone 1991).

Patayan II sites date to between A.D. 1000 and 1500 and cover a much wider spatial distribution than did the prior phase. Sites are found from southern Nevada to the Sierra Pinacate of northern Mexico, from eastern California to the Lower Gila River (Stone 1991). These are often found in association with both Hohokam and Anasazi ceramics, suggesting increased trade during this period. Although these ceramic traditions are intermixed, the Patayan ceramic tradition does not appear to have been influenced by them (Moreno et al. 1997:14). Huckell (1986) has suggested that andesite metates were first produced in the Big Bend Quarry near Bullhead City during this period.

In 1300 the Cerbat, a branch of the Patayan cultural manifestation and probable ancestors of the modern Hualapai and Havasupai, migrated onto the Coconino plateau from the west. They generally lived in brush shelters and ranged as far upstream as the Little Colorado River in search of game and wild plant foods. The Cerbat also planted crops in areas of fertile soil or permanent springs. It's possible the Cerbat had cultural ties with the earlier Cohonina (not discussed herein).

There is considerable evidence that the Cerbat were ancestral Pai peoples. While the material culture of the Havasupai is very similar to the Cerbat, it is not

much like that known for the pre-abandonment Cohonina. The Cohonina used architectural forms, including pithouses and walled plazas, that the Havasupai never used, and the forms they did share (such as ramadas and irregular surface structures), were common throughout a large portion of Arizona and the Great Basin. More important, perhaps, is the fact that the Cerbat also constructed these latter kinds of structures. Flaked stone artifacts tell a similar story, as Havasupai projectile points resemble Cerbat points and not the distinctive "Cohonina point". In addition, the Cerbat, Hualapai and Havasupai all used slab metates while the Cohonina much more frequently used scoop and trough types. There is little in common between Cerbat, Hualapai, and Havasupai pottery and that of the Cohonina except the techniques of construction. Firing techniques appear to have been different (Hanson 1999).

Protohistoric Period

The Protohistoric Period dates from approximately A.D. 1450 to 1700 and documentation consists primarily of accounts from early explorers and missionaries. By the 1700s, the Spanish slave trade and horse trade resulted in an increase in warfare and the development of new tribal alliances (Stone 1981). At European contact, the project area lay in an area that was used by Upland Pai groups, such as the Hualapai and, possibly, Western Yavapai to the south. Both groups spent much of the year near water sources on the upper bajadas of the region's mountain ranges, spending little time at lower elevations where water would have been scarce or nonexistent. Further south, some Western Yavapai occasionally visited the Colorado River to farm during the summer and for this reason they were often referred to as the "red water people" (Gifford 1936). Older prehistoric trails between the mountains and the river continued to be used during this period. Several of the more important of these strands are commonly referred to as the Mojave Trail. This trail crossed the river and continued on to the Pacific coast and was used for trading expeditions.

Pai bands were typically small and highly mobile. They utilized a wide range of wild animal and plant resources, of which mesquite and mescal stalks were the most important. Other resources included greens, pinon, berries, and cactus fruits, as well as animal resources including deer, bighorn sheep, antelope, rabbit, packrat, squirrel, and lizards (Khera and Mariella 1983). The Hualapai came into conflict with the Anglo settlers, especially between 1865 and 1869, which was known as the Hualapai War. After a tragic internment at La Paz in 1874, the current reservation at Peach Springs was established in 1883. The Western Yavapai were settled on several smaller reservations including one near Prescott (Khera and Mariella 1983; Stone 1987).

Historic Period

Although explorers, missionaries and fur trappers probably skirted the project area, which is inland from the river, the Colorado was a major transportation

corridor from the earliest historic period. Spanish explorer Melchior Diaz is believed to have been the first non-Indian to visit the region in 1540, traveling as far north as the Gila River and, possibly, up into southern Nevada. In 1605, Oñate traveled down the Bill Williams River to the Colorado and in 1776 Father Garces, a Spanish padre, crossed the Colorado River near Katherine Landing, just north of Davis Dam (Malach 1979; Messersman 1991). American fur trappers also moved along the river beginning in about 1820.

William Harrison Hardy established Hardyville in 1864 at the current location of Bullhead City. Its main function was as a ferry and store and for the offloading of Colorado River freight and transporting it east to mining communities such as Mineral Park and Cerbat. A number of mines and mining districts were developed in the Cerbat Mountains, such as at Mineral Park in 1871 and, even further east, at Hackberry (Schrader 1909; Gardner 1936; Malach 1977).

A number of transportation corridors were established between the Colorado River and the mining districts where supplies were hauled by donkey, horse, and briefly by camel. The first of these was the Beale Wagon Road. Between 1857 and 1859, Lieutenant Beale and a troop of soldiers surveyed and constructed this 1,000-mile road from Fort Smith, Arkansas to the Colorado River. Beale apparently followed existing Native American trails along ridgelines, including portions of the Mojave Trail. This road, which was a popular immigrant trail during the 1860s and 1870s, ran between Kingman and Fort Mohave, which Beale established to protect overland travelers and military supply trains (Coolidge 1976; Malach 1979, 1982; Messersman 1991). Water availability was the primary reason railroad engineer Lewis Kingman routed the Atlantic and Pacific (later Atchison Topeka & Santa Fe and now Burlington Northern & Santa Fe) through the area in 1883.

Although Lewis Kingman was more interested in building a railroad than a town, the engineer understood the impact that water and the railroad would have upon a region with an expanding ranching, mining and transportation economy. Kingman platted the community bearing his name in 1882. The purpose of Kingman's townsite plan was to centralize intensive land uses, and return investments to the railroad company. The town was designed as a work camp, watering station and railhead. The designation of the Old Trails Highway in the 1920s (later the route of U.S. Highway 66) brought more people into the area. The construction of the Boulder (Hoover) Dam in the early 1930s was an additional magnet for growth. However, the activities at the Kingman Army Airfield during and after World War II led to a rapid expansion of the Kingman area population.

Following the war, Kingman quickly became a regional center for highway service (Historic Route 66), ranching and mining as well as government administration. To capitalize on this new growth, Kingman expanded primarily in response to the ease of availability of utilities, transportation corridors, and

topographic constraints. In 1926 US Route 66 was established, mainly by cobbling together existing roads, paving them, and constructing signs and roadside facilities. The road ran 2,448 miles between Chicago and Los Angeles. Route 66 (now S.R. 66) ran through Kingman, following the National Old Trails Road; it currently serves as Kingman's main thoroughfare. Although the road was not completely paved until 1938, it was heavily used, carrying Okies during the depression, military traffic during WWII, and vacationers to the Southwest during the 1950s and 1960s. Today, Kingman remains an important regional center for many of the same reasons it was founded. Kingman continues to be a major hub of transportation, commerce and government administration. And, although the railroad is still important to local commerce, it is no longer the fundamental economic element in the community.

Project Status

Portions of the Project site were surveyed in 1981-1982 (Schilz 1981; 1982; Schilz et al. 1981). All of the Project site along with the proposed laydown areas, access road, Gen-Tie, and switchyard will be subjected to a new cultural resources survey. This survey will be conducted using survey transects that are more narrow than used during the 1981-1982 survey effort. The new survey will be conducted by the Hualapai Tribe Cultural Resources group. It is anticipated that a Data Recovery Treatment Plan can be prepared and any data recovery activities completed, if necessary, during the remainder of 2010.

A Class I (literature search) report has been prepared and is included in **Exhibit E-1**. (Mitchell 2009). Because of the prior survey effort (Schilz 1981; 1982; Schilz et al. 1981), the types and distribution of cultural resources within the Project area are well understood. These can be characterized as very small, discreet sites separated by large expanses with excellent surface visibility and few isolated artifacts. Most of the identified sites were associated with a series of northwest-southeast trending stabilized sand dunes; because of the lack of water and other resources, the sites are probably a result of short-term forays to collect and process grass seeds. The typical site consisted of 30-100 surface artifacts with no or very limited subsurface remains. Approximately one-third of the sites consisted entirely of scatters of thermally-altered rock, probably the result of seed parching. Historic era sites are rare and tend to be small trash scatters or corrals.

In addition to the Class III pedestrian survey, an ethnographic study of the Project area will be prepared by the Hualapai Tribe and consultation has been initiated by Western with appropriate tribes in the region. The Hualapai have identified Traditional Cultural Properties (TCP). Potential impacts to cultural resources are being studied through the federal process and in consultation with the Hualapai.

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EXHIBIT E-1

HUALAPAI VALLEY SOLAR, LLC

Class I Cultural Resource Report for the Proposed Hualapai Valley Solar Project, Mohave County, Arizona

Modified for public distruibution.

July 24, 2009

Class I Cultural Resource Report for the Proposed Hualapai Valley Solar Project, Mohave County, Arizona

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SHPO Standardized Report Abstract

AGENCY: Arizona State Land Department

REPORT TITLE: Class I Cultural Resource Report for the Proposed Hualapai Valley Solar Project, Mohave County, Arizona

DATE OF REPORT: July 24, 2009

PROJECT DESCRIPTION: Class I report of previously recorded cultural resources within the Proposed Hualapai Valley Solar Project, Mohave County, Arizona. The proposed Project will establish a 340 megawatt solar-powered electric generation facility. The HVS Project would include a dispatchable thermal energy storage system. In addition, the HVS Project would include an electric transmission line and substation site to interconnect with the regional electric transmission grid.

LOCATION: Township 25, 26 South, Range 15, 16 West, Red Lake (Sections 4-9, 13-20, 22-33, 36), Music Mountain NW (Sections 2-4, 9-11, 13-20, 28, 33, 34), Music Mountain SW (Sections 19-24, 27-28, 33-34), Mt. Tipton (Sections 29, 32), Mt. Tipton SE (Sections 1, 5, 6, 19-36), Mt. Tipton SW (Sections 21, 22, 25-36) USGS 7.5' topographic quadrangles, Mohave County, Arizona.

NUMER OF ACRES REVIEWED: approximately 22,400

METHODOLOGY: The previously recorded cultural resources and investigations in the Project area, including a one mile-wide buffer, were examined using data received from the Arizona State Museum site file check to determine if known cultural resources would be potentially impacted by the proposed Project. Information from Bureau of Land Management General Land Office, National Register of Historic Places, National Historic Landmarks, Arizona Historic Site List, and historic trails listings from National Parks Service, BLM, and Arizona State Parks were also reviewed.

NUMBER OF SITES: 43

ELIGIBLE: 4 (all within 1-mile buffer)

SITES OF UNKNOWN ELIGIBILITY: 5 (2 within Project area)

NOT ELIGIBILE SITES: 34 (18 within Project area)

COMMENTS: The literature search and records review of the Project area conducted by kp environmental identified 65 sites previously recorded within the project area, 22 of which have been mitigated through a data recovery program in 1982. Of the remaining 43 sites, 4 are considered eligible but are not within the Project area; 5 are unevaluated, 2 of which are in the Project area; and 34 are not considered eligible, 18 of which are in the Project area.

1.0 Introduction

Hualapai Valley Solar, LLC (HVS) requested that kp environmental complete a Class I cultural resource literature search and records review for the Proposed Hualapai Valley Solar Project. HVS is developing a 340 megawatt (MW) solar-powered electric generation facility. The HVS Project would use concentrating solar power trough technology to capture the sun's heat and transfer that heat to generate steam to power traditional steam turbine generators. The HVS Project would include a dispatchable thermal energy storage system. In addition, the HVS Project would include an electric transmission line and substation site to interconnect with the regional electric transmission grid.

2.0 Project Area

The Project area is located in multiple sections of Township 25 and 26 South, Range 15 and 16 West of the Red Lake (Sections 4-9, 13-20, 22-33, 36), Music Mountain NW (Sections 2-4, 9-11, 13-20, 28, 33, 34), Music Mountain SW (Sections 19-24, 27-28, 33-34), Mt. Tipton (Sections 29, 32), Mt. Tipton SE (Sections 1, 5, 6, 19-36), Mt. Tipton SW (Sections 21, 22, 25-36) USGS 7.5' topographic quadrangles in Mohave County, Arizona. The Project area is north of the City of Kingman, Arizona adjacent Red Lake (Figure 1).

3.0 Methods

The previously recorded cultural resources and investigations in the Project area, including a one mile-wide buffer, were examined using data received from the Arizona State Museum (ASM) site file check to determine if known cultural resources would be potentially impacted by the proposed Project. Information from Bureau of Land Management (BLM) General Land Office (GLO), National Register of Historic Places (NRHP), Arizona Historic Site List, and historic trails listings from National Parks Service (NPS), BLM, and Arizona State Parks were also reviewed.

4.0 Cultural-Historical Setting

The following description of the cultural history of the Project area is drawn from the Grand Canyon culture area/northern Arizona desert region (Fairley 2003) and the Hakataya (Rogers 1945; Colton 1945; Euler 1963). The following discussion is divided into prehistoric and historic periods. The prehistoric periods include the Paleoindian, Archaic, and Prehistoric/Protohistoric.

Prehistoric

Paleoindian

The earliest known record of human habitation in Arizona's desert regions dates to approximately 12,000 years (Haury 1950). These Paleoindian hunters-gatherers were highly mobile, and surface cultural remains associated with their habitation and subsistence sites are rare, as Paleoindian cultural materials are often buried deep beneath Holocene sedimentary deposits.

The Paleoindian period, approximately 10,000 to 7500 B.C., is characterized by small, nomadic bands that followed megafauna and gathered wild plants. Sites from this period have been primarily documented in southern Arizona (Cordell 1984; Haury 1950; Haynes 1986; Huckell 1984). Currently there is a paucity data regarding Paleoindian deposits in the Grand Canyon and northern deserts area of Arizona (Fairley 2003:75).

The subsistence practices of early hunter-gatherers changed approximately 10,000 to 8000 B.C. with the extinction of large game, as well as with the environmental changes associated with the Pleistocene/Holocene climatic transition (Guthrie 2006; Martin 1967). The overall lifestyle of the early hunter-gatherers continued into the Archaic period (ca. 8000 to 1000 B.C.), but increased aridity during the early- to mid-Holocene brought about a change in the occurrence of plant species in the Southwest (Van Devender et al. 1987). Many of these drought-tolerant plants, such as mesquite, paloverde, and screwbean pods; saguaro and other cactus fruits; and agave, were exploited by prehistoric peoples. These plants provided a protein-rich food source that supplemented the Archaic diet of small game.

Archaic

The Early Archaic period, approximately 8000 to 5000 B.C., is characterized by a hunting and gathering lifestyle, similar to the preceding Paleoindian period (Table 1). A major difference however was a climatic drying and warming trend leading to desert conditions, and the disappearance of Pleistocene big game, through natural or human agents. Hunting focused on modern game animals and gathering focused on seasonally available resources, with Archaic groups maintaining a significant degree of residential mobility.

Environmental stress may have played a factor in drawing people to lower elevations near perennial water sources in northern Arizona (Fairley 2003). As the Archaic period progressed (Middle Archaic, ca. 5000 to 3000 B.C.), some populations began to shift from a residentially-based foraging strategy to a more wide ranging highly mobile collecting strategy and began to experiment with encouraged plants. Various wild plant resources were encouraged through selective planting or reseeding, weeding of competitor species, and supplemental watering. Seasonal rounds were generally

maintained, with encouraged plant stands being revisited during harvest time. Tools identified during the Archaic period such as metates, manos, and mortars demonstrate a significant focus on processing wild plant foods.

The Late Archaic, approximately 3000 B.C. to 1000 B.C., is much like the preceding phase in the Grand Canyon cultural area with the exception of ritualized use of the caves within the canyon, and re-occupation of the higher elevations (Fairley 2003:80-82). Further west, the subsistence strategy of the Late Archaic people continues to focus on hunting, gathering, and processing of wild foods.

Table 1
Grand Canyon Culture History Chronology (Fairley 2003)

Period	Phase	Approximate Time Span
Archaic		ca. 8000-1000 B.C.
	Early	ca. 8000-5000 B.C.
	Middle	ca. 5000-3000 B.C.
	Late	3000-1000 B.C.
Preformative		ca. 1000 B.C.- A.D. 400
Formative		c.a. A.D. 400-1250
	Early	c.a. A.D. 400-1000
	Late	c.a. A.D. 1000-1250
Late Prehistoric/		
Protohistoric		c.a. A.D. 1250-1776
Historic		c.a. A.D. 1776-1950

Preformative

The Preformative, approximately ca. 1000 B.C.-A.D. 400, is a period of increasing sedentism as it gives way to small-scale horticulture, especially with the introduction of domestic cultigens. Maintaining small fields and crops meant increased sedentism, and Preformative populations along floodplains and alluvial fans began to assemble into permanent villages. Preformative villages are likely to be deeply buried under alluvium because of their location on floodplains and alluvial fans.

Formative

The Formative, approximately A.D. 400-1250, is a period characterized by agriculture and a well-established sedentary, village life (Fairley 2003:87). Ceramics are first present in the Grand Canyon area ca. A.D. 400, and occupation of the canyon is abandoned by the Formative inhabitants by A.D. 1300. According to Euler (1967:69), the ancestors of the Hualapai and Havasupai moved to the Colorado Plateau and the southwestern edges of the Grand Canyon (Fairley 2003:88).

Hakataya

The Hakataya period applies specifically to northwestern Arizona and the Project area. This is a period characterized by the presence of ceramics. The three phases were initially designated Yuman I, II, and III (Gladwin and Gladwin 1930; Colton 1939; Rogers 1945); however, Hakataya as developed by Euler (1963) is used here. Euler divided the Ceramic period into four phases based on ceramic and metate forms (Table 2).

The Cohonina phase, approximately A.D. 700-1150, is characterized by its association of Anasazi and Sinagua pottery types; surface structure dwellings; paddle-and-anvil pottery making techniques; San Francisco Mountain Gray Ware; and trough metates open at both ends.

Table 2
Hakataya Culture History Chronology (Euler 1963)

Period	Phase	Approximate Time Span
Hakataya		
	Cohonina	ca. A.D. 700-1150
	Prescott	ca. A.D. 900-1200
	Cerbat	ca. A.D. 700-1300
	Amacava	ca. A.D. 700-Historic
	Patayan I	ca. A.D. 500-1050
	Patayan II	ca. A.D. 1050
	Patayan III	ca. A.D. 1500

The Prescott phase, approximately A.D. 900-1200, is characterized by shallow, rectangular pit houses later replaced by surface pueblos; paddle-and-anvil pottery making techniques and fired in an uncontrolled environment; Prescott Gray Ware; and trough metates open at both ends.

The Cerbat phase, approximately A.D. 700-1300, is characterized by rock shelters and u-shaped jacal structures; paddle-and-anvil pottery making techniques and fired in a controlled and oxidizing atmosphere; Tizon Brown Ware; and shallow, basin-shaped, slab metates.

The Amacava phase, approximately A.D. 700-Historic, is characterized by temporary campsites; paddle-and-anvil pottery making techniques and fired in a controlled and oxidizing atmosphere; lower Colorado Buff Ware; and slab metates.

The Patayan sequence is based on ceramic typology. The Patayan I phase first appears in northwest Arizona between A.D. 400-600, and most date between A.D. 500 and A.D. 1050. The Patayan II phase emerges approximately A.D. 1050 along the lower Colorado River and had definite Classic Hohokam influences. The Patayan III phase emerges approximately A.D. 1500 and is documented through ethnographic and ethnohistorical data.

Late Prehistoric/Protohistoric

The Late Prehistoric/Protohistoric period dates from approximately A.D.1250-1776 in the Grand Canyon area. After ancestral Puebloan year-round occupation of the region ended, it's believed that the ancestors of the Pai and Southern Paiute occupied the region for the next 600 years. These sites are characterized by the presence of Tizon Brown Ware or Southern Paiute Brown Ware and Desert Side-Notched projectile points (Fairley 2003:97).

The Late Prehistoric/Protohistoric period in northwestern Arizona and specifically the Project area is primarily the territory of the Hualapai. They inhabited an extensive territory in northwestern Arizona and the fluid nature of their hunting and gathering bands allowed them the ability to exploit a wide range of desert resources (McGuire 1983). Plant resources included cacti, mesquite, creosote bush, paloverde, juniper, oak, walnut, piñon, and cane. Animal resources included rabbits, rodents, deer, antelope, mountain sheep, and birds. While their subsistence economy was based primarily on hunting and gathering, there is evidence that the Hualapai also engaged in trading resources (dried mescal, red hematite, and basketry) with neighboring Tribes (McGuire 1983). Their traditional burial practice was cremation, which later changed to burials in rock slides and cairns during the American Period.

Historic

The Historic period in Arizona dates roughly from 1753 to 1954. The 1753 date was chosen as it represents the founding of the first permanent Spanish settlement in Arizona. Dates of Protohistoric and Historic periods can differ across Arizona, usually based on dates of contact with Europeans and dates of permanent settlement by Europeans. For the purposes of this study, the aforementioned dates will be used.

It was not until 1776 when direct contact was made with the Hualapai. Franciscan missionary, Francisco Gracés, in an attempt to expand the Catholic mission frontier traveled through the region around what is now Kingman and Peach Springs (Coues 1900,1:316). He was eventually killed in 1781 by Yumans along the Colorado River (McGuire 1983). The Hualapai were essentially left alone for the next 70 years until the 1850s when the U.S. Army began expeditions through northern Arizona in search of railroad routes to the west coast. Captain Lorenzo Sitgreaves made a successful and peaceful first contact with the Hualapai in 1851 but subsequent contact with other bands led to conflict. The Sitgreaves expedition was followed by two others in 1853-1854. Other explorers from New Mexico traveling with François Aubry also ran into a conflict with the Hualapai near Truxton Canyon; however, Lt. Whipple's railroad surveyors had no trouble with the Hualapai (Dobyns and Euler 1960:51). Lt. Beale's road-building expedition across Hualapai territory in 1857-1858 set the stage for Anglo settler – Hualapai conflict, which resulted in a series of hostile contacts between the two groups (McGuire 1983). It is not clearly understood from the historical or ethnographical record why certain conflicts occurred and others did not.

There was a short period of enforced peace between the settlers and the Yuman Tribes with the establishment of Fort Mohave in 1859; however, with the discovery of gold near Prescott in 1863 conflicts between settlers and the Hualapai soon developed. The killing of a respected Hualapai leader in 1866 by Anglos triggered retaliation that ultimately resulted in the U.S. Army stepping in and engaging the Hualapai in several large-scale battles in 1867. Lt. Col. William R. Price waged a campaign that included burning their villages, and destroying their crops and food caches. By 1869 most of the Hualapai leaders had surrendered and the Hualapai War had ended (Dobyns and Euler 1960, 1970). The Hualapai was interred initially at Camp Beale Springs and then moved to the Colorado River Indian Reservation. In the brief four or five years that the Hualapai were gone Anglo ranchers and miners had taken over the habitable areas of Hualapai territory, taken over springs, and were herding cattle over large tracks of grassland. At this point the Hualapai were unable to return to their traditional subsistence activities, and many looked for jobs in the mines. In 1883 a 900,000-acre reservation was established for them, which represented only a fraction of their original territory. After 1891 few Hualapai remained on the reservation, many held jobs with the railroad, mines, or ranches, and sent their children to be educated in Kingman and Hackberry, AZ to learn Christian customs and Anglo social patterns (McGuire 1983).

5.0 Previous Research

Site and project files were checked at the ASM and the BLM Kingman field office and the data received were examined to determine if previously recorded cultural were within the Project area and buffer. The ASM and BLM records check revealed that 19 projects have been conducted within the one mile-wide buffer of the Project area, with 11 of the projects occurring within or crossing the current Project area (Table 3).

The Pataya Gas Storage Facility Project (1980-176.ASM) was located within the Project area (Figure 2). Sixty-seven sites were recorded for this project, twenty-two of which were mitigated through a data recovery program (Schilz 1982).

The Five Seismic Lines in Mohave County Project (1984-78.ASM) was located within the Project area (Figure 2). No sites were recorded for this project in 1984 (Bostwich and Dechambre 1984).

The Mead-Phoenix 500 kV Survey Project (1984-128.ASM) was located within the Project area (Figure 2). Fifty-eight cultural sites were recorded for the project in 1984, but none within the Project area (Keller 1986).

The Water Pipeline for TransAm Energy Inc. in Hualapai Valley Project (1992-70.ASM) was located within the Project area (Figure 2). Four cultural sites were recorded for the project in 1992, but none within the Project area (Blair 1992).

The Mead-Phoenix 500 kV - Towers Project (1994-458.ASM) was located within the Project area (Figure 2). Three cultural sites were recorded for the project in 1994, but none within the Project area (Purcell 1994).

The Mead to Phoenix Project (1994-459.ASM) was located within the Project area (Figure 2). Thirteen cultural sites were recorded for the project in 1994, but none within the Project area (Purcell and Chadderdon 1996).

The Red Lake Gas Storage Survey Project (2003-338.ASM) was located within the Project area (Figure 2). Two cultural sites were recorded for the project within the Project area (Foster and North 2002).

The Red Lake Air Drop (parachute testing) Project (030-00-020.BLM) was located within the one mile-wide buffer, but not within the Project area (Figure 2). No sites were recorded for this project in 1999.

The remaining 12 BLM project records could not be located in the Kingman field office and the data are not available at this time.

Table 3. Summary of Previous Archaeological Research

Quadrangle	Agency No. / Project Description	Sites	Reference	Project Area
Red Lake Mt. Tipton SE	1980-176.ASM / Pataya Gas Storage Facility	67	Breece and Schilz 1980; Schilz 1981;Schilz et al. 1981; Schilz 1982	Within project area
Red Lake Music Mts NW	1984-78.ASM / Five Seismic Lines in Mohave County	0	Bostwich and Dechambre 1984	Within project area
Red Lake Music Mts NW Music Mts SW	1984-128.ASM / Mead-Phoenix 500 kV Survey	58	Keller 1986	Within project area
Red Lake Music Mts NW	1992-70.ASM / Water Pipeline for TransAm Energy Inc. in Hualapai Valley	4	Blair 1992	Within project area
Red Lake Music Mts NW Music Mts SW	1994-458.ASM / Mead-Phoenix 500 kV - Towers	3	Purcell 1994	Within project area
Red Lake Music Mts NW Music Mts SW	1994-459.ASM / Mead to Phoenix Project	13	Purcell and Chadderdon 1996	Within project area
Red Lake Mt. Tipton SE Mt. Tipton SW Music Mts NW	2003-338.ASM / Red Lake Gas Storage Survey	2	Foster and North 2002	Within project area
Red Lake	030-00-020.BLM / Red Lake Air Drop (parachute testing)		Cartwright 1999	Buffer
Music Mts NW	030-93-3.1.BLM / No Data	-	-	Buffer
Music Mts SW	030-00-023.BLM / No Data	-	-	Buffer
Red Lake	03-103.BLM / No Data	-	-	Buffer
Red Lake	03-112.BLM / No Data	-	-	Within project area
Mt. Tipton SE	03-125.BLM / No Data	-	-	Within project area
Red Lake	03-142.BLM / No Data	-	-	Buffer
Mt. Tipton SE	03-150.BLM & 03-150 #2-2.BLM/No Data	-	-	Within project area
Mt. Tipton SE	03-18.BLM / No Data	-	-	Buffer
Red Lake	03-19.BLM / No Data	-	-	Within project area
Red Lake	03-53.BLM / No Data	-	-	Buffer
Mt. Tipton SE	03-73.BLM / No Data	-	-	Within project area
Mt. Tipton SE	Green 80 #2-1.BLM / No Data	-	-	Buffer

Sixty-five sites have been previously recorded within the Project area and the 1-mile buffer; and of the 65 sites, 22 have been mitigated through a data recovery program (Table 4). The remaining sites include 19 artifact scatters, 7 rock features, 6 lithic scatters, 4 milling stations or seed processing sites, 3 camp sites, and a hearth, habitation site, temporary camp site, and a historic trash dump site. Twenty of the sites are located within the Project footprint or the project components (Figure 3).

Four sites are considered eligible and include a habitation site (BLM 1505), a temporary camp site (BLM 1507), an artifact scatter (AZ F:8:74.ASM), and a rock feature (AZ F:8:62.ASM); however, all four sites are located outside the Project footprint but within the 1-mile buffer. Three campsites (AZ F:8:64.ASM, AZ F:8:65.ASM, AZ F:8:66.ASM) in the 1-mile buffer, one lithic scatter (AZ G:5:3.ASM) in the Project footprint, and one milling station (BLM 1003) also in the Project footprint had no eligibility recommendations. The remaining 33 sites were not considered eligible by the recorder. With the exception of the 22 sites mitigated in 1982, formal evaluation of these has not been implemented.

No National Register listed sites or National Historic Landmarks were located within the Project area or the buffer. However; according to BLM, there is at least one area of concern for the Hualapai Tribe in the vicinity of the HVS Project. Red Lake is considered to be a Traditional Cultural Place for the Hualapai and the placement of certain components of the HVS Project may be of concern to the Tribe. Subsequent tribal scoping (Loretta Jackson Kelly, personal communication 2009) confirmed the Red Lake area of concern for the Hualapai Tribe. Red Lake is considered to be, among other things, a location where the Hualapai people were drawn to and gathered at certain times. The Class I data as depicted on Figure 3 gives a good indication of the this fluid settlement pattern around a portion of Red Lake to support Hualapai oral history of the area.

5.1 National Register of Historic Places Evaluation

To be eligible for listing in the National Register, a cultural resource must meet one of the four criteria defined by Title 36, Part 60, of the Code of Federal Regulations (36 CFR 60), which reads as follows:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or

Table 4. Previously Recorded Sites

Site	Site Type	Recommendation (by whom/date)	Occurrence	Mitigated
AZ F:8:6 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:12 (ASM)	Lithic Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:13 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:14 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:15 (ASM)	Milling Station	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:18 (ASM)	Lithic Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:19 (ASM)	Lithic Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:20 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:21 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:22 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:23 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:24 (ASM)	Habitation Site	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:25 (ASM)	Temporary Camp	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:26 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:27 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:28 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:29 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:30 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:31 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:32 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:33 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:34 (ASM)	Temporary Camp	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:37 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:38 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:39 (ASM)	Lithic Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:40 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:41 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:42 (ASM)	Lithic Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:43/44 (ASM)/BLM 1002	Artifact Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ F:8:45 (ASM)	Lithic Scatter	Not Considered Eligible (recorder 1981)	Project Area	
AZ F:8:46 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:47 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	1-mile buffer	1982
AZ F:8:48 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	1-mile buffer	1982
AZ F:8:49 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	1-mile buffer	1982

Table 4. Previously Recorded Sites				
Site	**Site Type**	**Recommendation (by whom/date)**	**Occurrence**	**Mitigated**
AZ F:8:50 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	1-mile buffer	1982
AZ F:8:51 (ASM)	Historic Trash Scatter	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:52 (ASM)	Rock Feature	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:53 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	1-mile buffer	1982
AZ F:8:54 (ASM)	Rock Feature	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:55 (ASM)	Campsite (midden present)	Considered Eligible (recorder 1981)	1-mile buffer	1982
AZ F:8:56 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:57 (ASM)	Rock Feature	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:58 (ASM)	Hearth	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:59 (ASM)	Lithic Scatter	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:60 (ASM)	Rock Feature	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:61 (ASM)	Rock Feature	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:62 (ASM)	Rock Feature	Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:63 (ASM)	Rock Feature	Not Considered Eligible (recorder 1981)	1-mile buffer	
AZ F:8:64 (ASM)	Small Campsite	Not Evaluated	1-mile buffer	
AZ F:8:65 (ASM)	Small Campsite	Not Evaluated	1-mile buffer	
AZ F:8:66 (ASM)	Small Campsite	Not Evaluated	1-mile buffer	
AZ F:8:73 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 2002)	1-mile buffer	
AZ F:8:74 (ASM)	Artifact Scatter	Considered Eligible (recorder 2002)	1-mile buffer	
AZ G:5:3 (ASM)	Lithic Scatter	Not Evaluated	Project Area	
AZ G:5:4 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ G:5:5 (ASM)	Artifact Scatter	Considered Eligible (recorder 1981)	Project Area	1982
AZ G:5:7 (ASM)	Artifact Scatter	Not Considered Eligible (recorder 1992)	1-mile buffer	
BLM 1001	Artifact Scatter	Not Considered Eligible (recorder 1976)	Project Area	
BLM 1003	Milling Station	Not Evaluated	Project Area	
BLM 1505	Habitation	Considered Eligible (recorder 1981)	1-mile buffer	
BLM 1507	Temporary Camp	Considered Eligible (recorder 1981)	1-mile buffer	
BLM 1558	Artifact Scatter	Not Considered Eligible (recorder 1980)	1-mile buffer	
BLM 1559	Milling Station	Not Considered Eligible (recorder 1980)	1-mile buffer	
BLM 1560	Milling Station	Not Considered Eligible (recorder 1980)	1-mile buffer	
BLM 1561	Milling Station	Not Considered Eligible (recorder 1980)	1-mile buffer	

(b) that are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that has yielded, or may be likely to yield, information important in prehistory or history.

In addition to these four criteria, there is a general stipulation that the property be 50 years old or older (for exceptions, see 36 CFR 60.4, Criteria Considerations). The importance of information that a property may yield is measured by its relevance to identified research questions that can be addressed through the analysis of particular property types. In addition to research potential, the cultural resources of Native Americans, Euroamericans, and other ethnic communities may possess public and ethnic value. Finally, cultural resources may also have broader public significance, such as serving to educate the public about important aspects of national, state, and local history and prehistory.

The first step in determining the significance of cultural resources is to define appropriate historic contexts. A historic context is a body of information about patterns or trends in history organized by three basic elements: theme, place, and time (NPS 1997). In essence, a historic context is a historically meaningful segment of the history or prehistory of a particular geographic area. Together, all of the various possible historic contexts for an area would form a comprehensive summary of all aspects of the area's history and prehistory.

A theme is the equivalent of a research problem, and a historic context is developed by placing the problem in an appropriate setting in both time and space. The context is linked to tangible cultural resources by the concept of a property type.

The historic contexts are presented below and follow the same structure. A short discussion of current research issues is followed by a set of research questions in each of the following sections. A discussion of data requirements, including a listing of pertinent property types, closes each context.

5.2 Research Questions

Chronology

Chronology is a key component in understanding the processes of cultural change in the Arizona desert regions. Sites located in northwestern Arizona, however, contain lack the remains of houses, pit features, and other substantial subsurface cultural deposits. Short of reliable absolute dates from well-understood contexts,

archaeologists have been forced to rely heavily on artifact cross dating, the origin of which was has been primarily lithic typologies. It is no surprise, therefore, that our knowledge of the chronology of cultures in the region continues to change and that our comprehension of regional cultural processes remains a work in progress. Key research questions are presented below.

Research Questions

- Can the sites yield information relating to established regional lithic and ceramic typologies?
- Can the Patayan ceramic chronology be further refined?
- Are there variations in the temporal framework in Patayan manifestations in relationship to the distance from the core area?

Data Requirements

In most areas of the Southwest, addressing issues of chronology requires samples suitable for absolute-dating analysis. Sample materials include botanical and faunal remains for radiocarbon dating, burned clay associated with cultural features for archaeomagnetic dating, and wood samples from specific species for tree-ring dating. Other, less-precise absolute-dating methods include thermoluminescence and obsidian hydration analyses.

Subsistence

The Desert area of northern Arizona is in a region of alternating mountains and plateaus, with rugged canyons of the Colorado River that were the lifelines of the Hualapai people. They provided water, and the mountains provided additional ecozones for natural food sources not found on the river plains.

Little is known when Paleoindian and Archaic foraging strategies changed to hunting and gathering cultures and bound them to floodplain resources. Nor when it exactly progressed to floodplain-based, logistically organized horticultural societies that continued to exploit wild riparian and desert resources. For the horticulturalists, using wild resources minimized risk imposed by an agricultural adaptation. The degree of organizational complexity needed to be responsive to a variety of environmental factors. As a result, household size, composition, and organization; the size of local population aggregates; the mix of resources used (cultigens or wild plants, riverine or desert resources) varied based on the distribution and availability of resources.

Research Questions

- What mix of resources did the Archaic people and the Hualapai use?
- If the resource mix changed through time, do these changes correlate with increasing population density, environmental fluctuations, or both?
- Are ethnographic models representative of prehistoric and/or protohistoric periods?

Data Requirements

Data required to answer these questions consist of faunal and floral remains from use contexts in Archaic, Prehistoric period, and protohistoric residential sites. Macrofloral and palynological samples from sealed cultural contexts (features) and from an array of plant and animal food-processing equipment are important components in defining the resource mix, and immunoassay residue analysis on lithic tools recovered from cultural contexts could potentially provide information on patterns of animal exploitation. As with chronological needs, contexts that can provide these data are rare.

Land-Use Patterns

Land-use patterns form an important part of a culture's adaptation to its surrounding environment, and its strategy characterizes and describes the ways in which a culture interacts with and exploits its natural resources. The organization of land-use strategies is patterned and is reflected in the set of functional site types embedded in the land-use system.

Analysis of land-use systems provides considerable insights into interactions between economic adaptations and changing environmental and social circumstances, and like subsistence systems, they operate in an ecological context and are, therefore, responsive to fluctuations in environmental conditions. Essentially land-use systems influence, and are influenced by a myriad of extant social conditions, such as organizational complexity, labor organization and scheduling, ritual and ceremonial activities, and interrelations with neighboring communities, among other factors.

Research Questions

- Did Hualapai site locations co-vary with environmental factors? If so, what factors appear to have been the most significant?
- How do site location and site type relate to the spatial distribution of raw-material sources in the region?

- Did site complexity influence the direction of trade relations with the Northern tribes versus the Southern and Eastern tribes?

Data Requirements

By obtaining information about residential, subsistence, and functional site-type patterning, we can reconstruct land-use strategies. Using subsistence, spatial, and chronological information obtained from residential sites, nonresidential site types, and land-use systems, the entire system can be defined. Elements comprising land-use systems (including issues of economy and seasonality) must be discerned from subsistence-related data recovered from each class of sites.

Contact and Interaction between Native Americans and Europeans and Euroamericans

Historical-period accounts of the primary Native American group in the Project area, the Hualapai, exist from the mid eighteenth and mid-nineteenth centuries. The first written account of Hualapai lifeways was first recorded by the Spanish in the mid eighteenth century. Archaeological information to support or augment ethnohistoric data is largely lacking. Important questions about protohistoric and historical-period Hualapai subsistence and settlement systems, as well as Indian conflicts remain.

Research Questions

- To what degree, if at all, did this Native American group rely on wild botanical and faunal resources during the mid eighteenth and early nineteenth centuries?
- Are ethnohistoric data representative of Hualapai subsistence and land use patterns? What resource mix did they rely on during the early historical period?
- How well, if at all, were European-introduced domesticated plants and animals incorporated into the Hualapai resource mix?
- What are the factors that contributed to Anglo – Hualapai conflicts in certain areas? Are these conflicts confined to a specific area, Band, or issue? Is there evidence of Hualapai alliances with other Tribes in these Anglo-Indian conflicts?

Data Requirements

Data required to answer these questions can best be obtained from one or more eighteenth to nineteenth century Hualapai residential sites or conflict. If the sites have stratigraphic depth, they may include sealed features that contain data that inform on subsistence, economic, social, and ritual aspects of past lifeways.

Historical-Period Occupation

The eighteenth and nineteenth century occupation of northern Arizona had a significant impact on the lives of the Native American people of the area. While changes were already underway in the Project area when the Europeans first encountered the area, more changes followed. During the protohistoric and historic periods the Native Americans turned to a more intensive agricultural practice with the addition of non-native crops, animals, trade goods, religion, and culture (McGuire 1983).

Research Questions

- How did the establishment of missions and presidios, as well as the introduction of new crops and livestock, affect settlement pattern, subsistence strategies and cultural traditions?
- Can the study of historic archaeological sites, in conjunction with archival research, tell about the lives of the Spanish, Mexican, and Euroamerican soldiers and settlers in the Hualapai area?
- How did the coming of the railroad affect patterns of settlement and rural economies? How did sidings, camps, spurs and other associated sites function in relation to the railroads and surrounding sites?

Data Requirements

While few historic resources have been previously recorded in the Project area, there is great potential for further research into the lives of migrants into the area. Excavation of historic archaeological sites, as well as ethnohistoric data and sources can reveal a wealth of information that may provide insight into the social fabric of the lives of the migrants into the area and the effects of those cultures on the Native culture.

6.0 Management Recommendations

The kp environmental intensive Class I cultural inventory of approximately 22,400 acres within the Proposed HVS Project area identified 65 previously recorded sites, 22 of which were mitigated in 1982. Of the remaining 43 sites, four are considered eligible for the National Register; however, these sites are located outside of the Project footprint. The Project area has been subjected to intensive field investigations in the past; however, there are sections of the project footprint that have not been surveyed and the largest survey that occurred in the Project area was conducted nearly 30 years ago. Therefore it is recommended that a Class III field survey be conducted of Project area so that all historical and archaeological resources are identified.

Since the 1982 data recovery program at Red Lake the body of knowledge of Hualapai archaeology has grown and today, although not complete, we have a greater

understanding of Hualapai subsistence and settlement patterns. By revisiting these previously recorded sites and re-evaluating them within the context of Red Lake and the surrounding areas, as well as the Hualapai land use and settlement patterns we will be able to get a better understanding of the people in prehistory in this region instead of yet another chronology based on material culture with nothing that ties that culture to the living people.

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EXHIBIT F – RECREATIONAL PURPOSES AND ASPECTS

As stated in Arizona Administrative Code R14-3-219:

> *"State the extent, if any, the proposed site or route will be available to the public for recreational purposes, consistent with safety considerations and regulations, and attach any plans the Applicant may have concerning the development of the recreational aspects of the proposed site or route."*

The Project site will not be available for public recreation purposes but the area around the site boundary would not preclude recreational uses.

Existing Conditions

In a regional context, Mohave County has many recreational opportunities, including bird watching, camping, hunting, hiking, horseback riding, bicycling, recreational shooting, hobby rock collecting, and off-highway vehicle driving. Additionally, non-commercial trapping in accordance with State and Federal laws is permitted on Bureau of Land Management (BLM)-administered land including most wilderness areas.

An estimated 1,000 miles of freshwater shoreline lie within Mohave County, including Lake Havasu, Lake Mead, Lake Mohave and Alamo Lake. The western boundary of Mohave County is formed by the path of the beautiful Colorado River. The western rim of the Grand Canyon and the Hualapai, Cerbat, and Music Mountains offer breathtaking views and contrasting climates. Recreational opportunities abound including camping, boating, fishing, waterskiing, hiking, horseback riding, Off Highway Vehicle (OHV) riding or just enjoying the natural beauty of the Southwestern sunbelt.

The larger Mohave County region is visited by a large number of recreational users. However, in the area of the HVS Project there is very little recreational use.

There are no Mohave County designated recreational facilities in the area of the Project.

The closest recreational area is on BLM land. The Project area is located within an area encompassed by BLM's Kingman Resource Management Plan (RMP). The Kingman RMP was reviewed to identify any designated Special Recreation Management Area (SRMA) within the vicinity of the Project.

No SRMAs were identified within the Project area. The closest SRMA is approximately 13 miles north of the Project site.

OHV use is a major recreational component within Mohave County. However, there are no designated OHV areas in the area of the Project.

Potential Effect

The closest BLM-designated SRMA is located 13 miles north of the Project; therefore, the Project will not affect any BLM SRMAs. The Project is located in a rural portion of Mohave County. As such, OHV recreation may occur within the vicinity of the Project. Because of the abundant OHV recreation opportunity within Mohave County, and the fact that the Project site will be located on existing private land, OHV recreation opportunity will not be impacted.

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EXHIBIT G – CONCEPTS OF TYPICAL FACILITIES

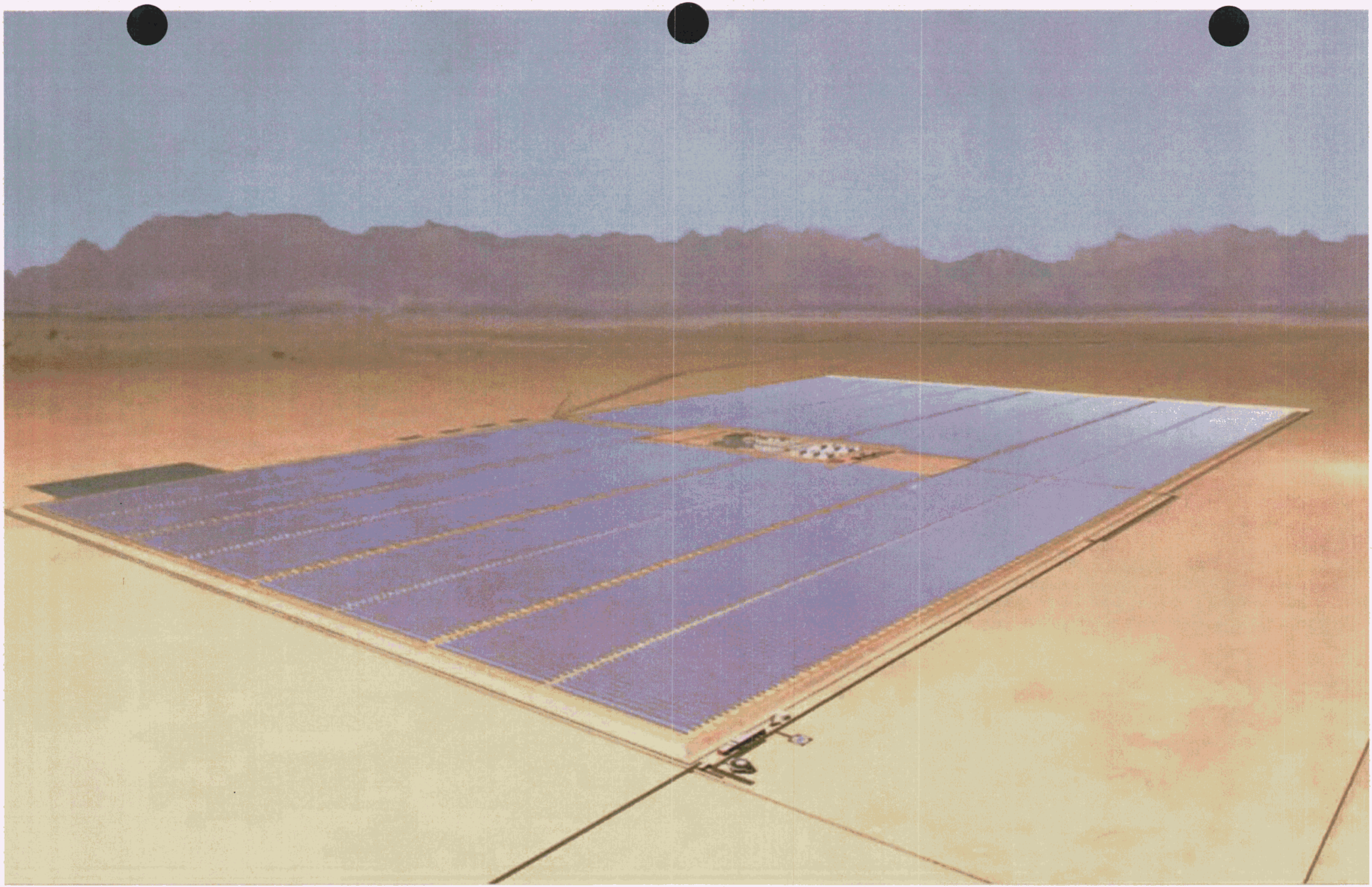
As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

> *"Attach any artist's or architect's conception of the proposed plant or transmission line structures and switchyards which applicant believes may be informative to the committee."*

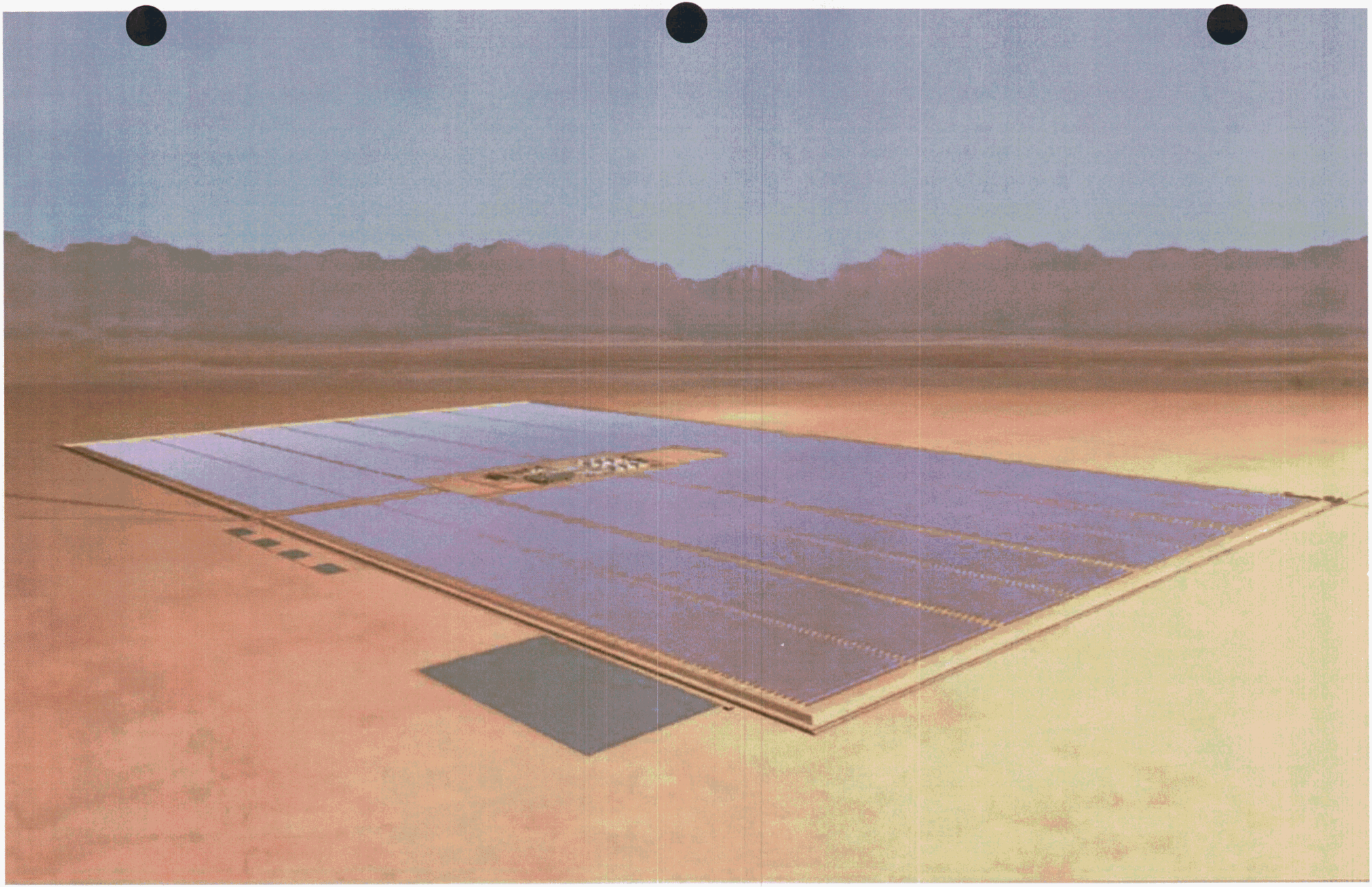
Exhibits G-1 through G-7 are Solar Plant Renderings.

Exhibits G-8 and G-9 are typical transmission line facilities.

Exhibits G-10 through G-19 are visual simulations of the Project.

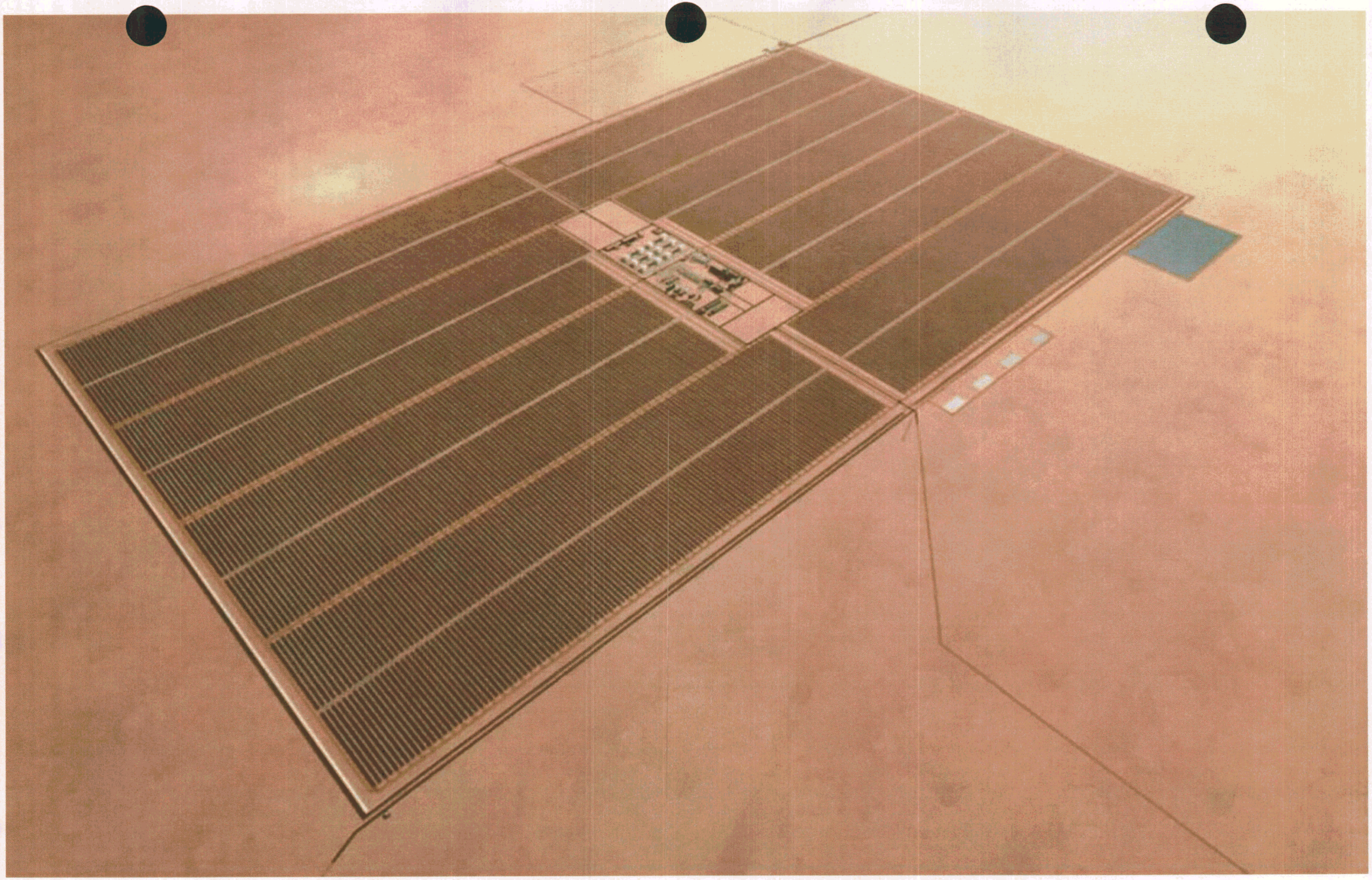


Solar Plant Rendering
Exhibit G-1

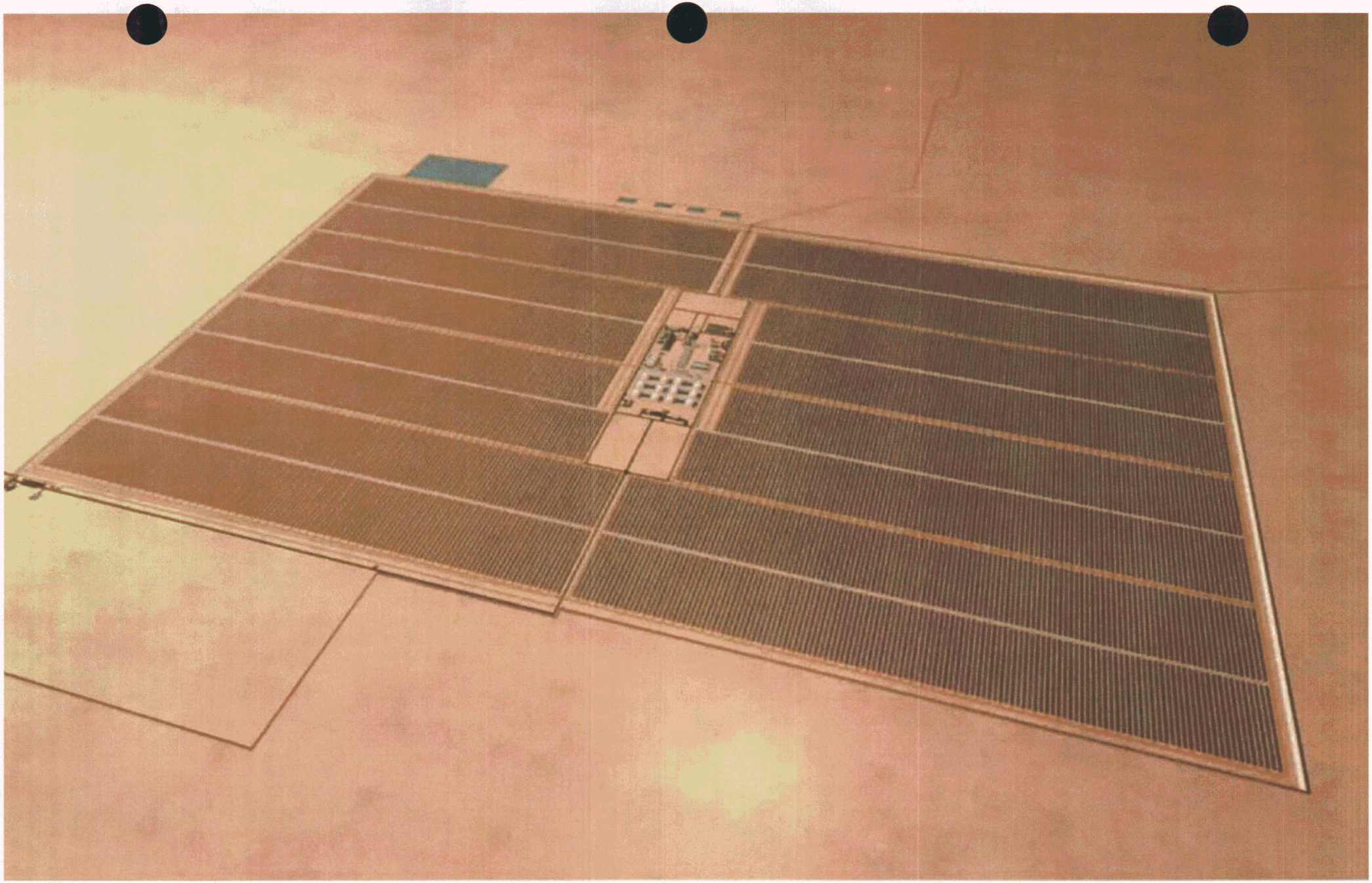


Solar Plant Rendering 1
Exhibit G-2

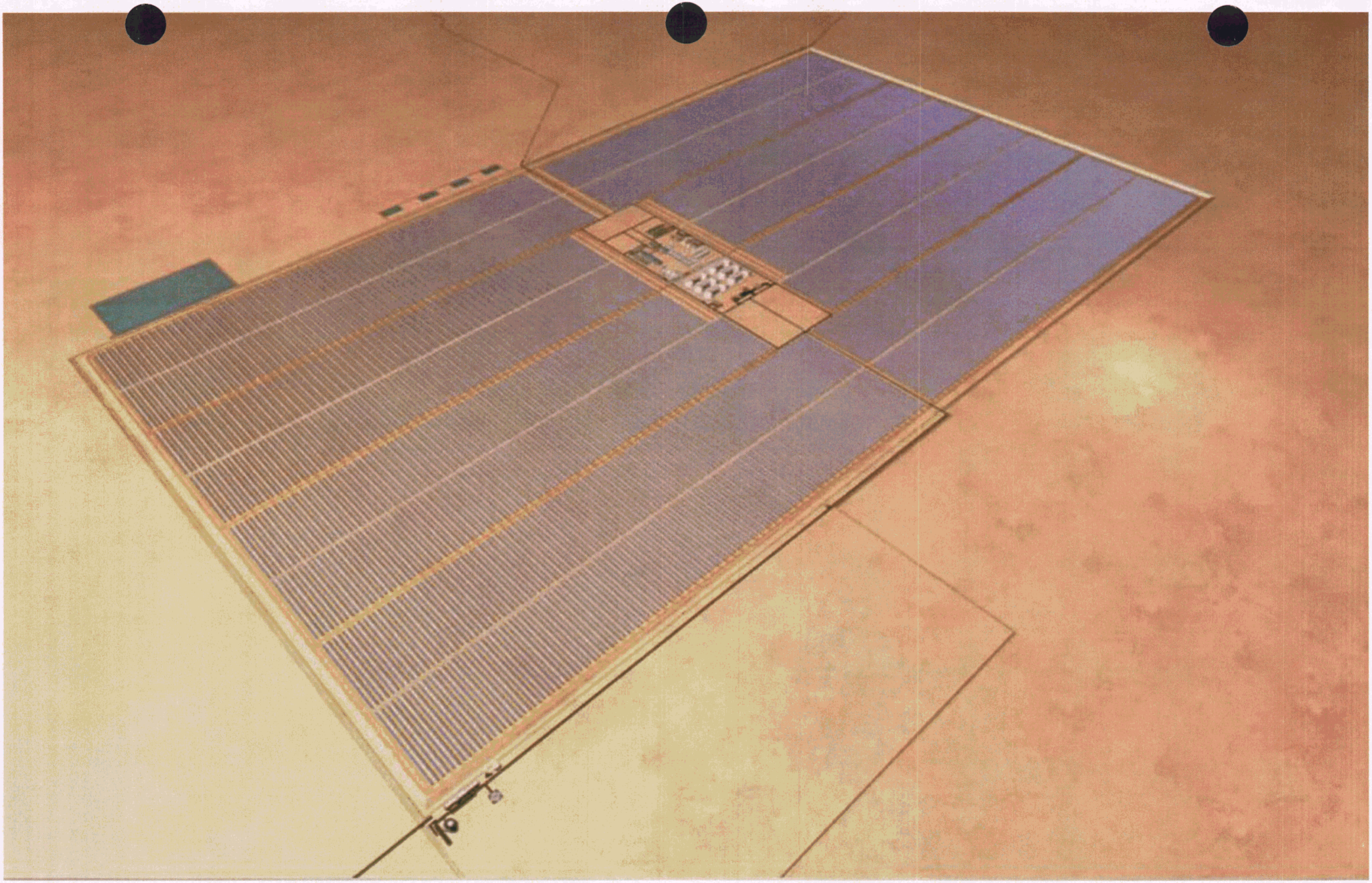
Solar Plant Rendering
Exhibit G-3



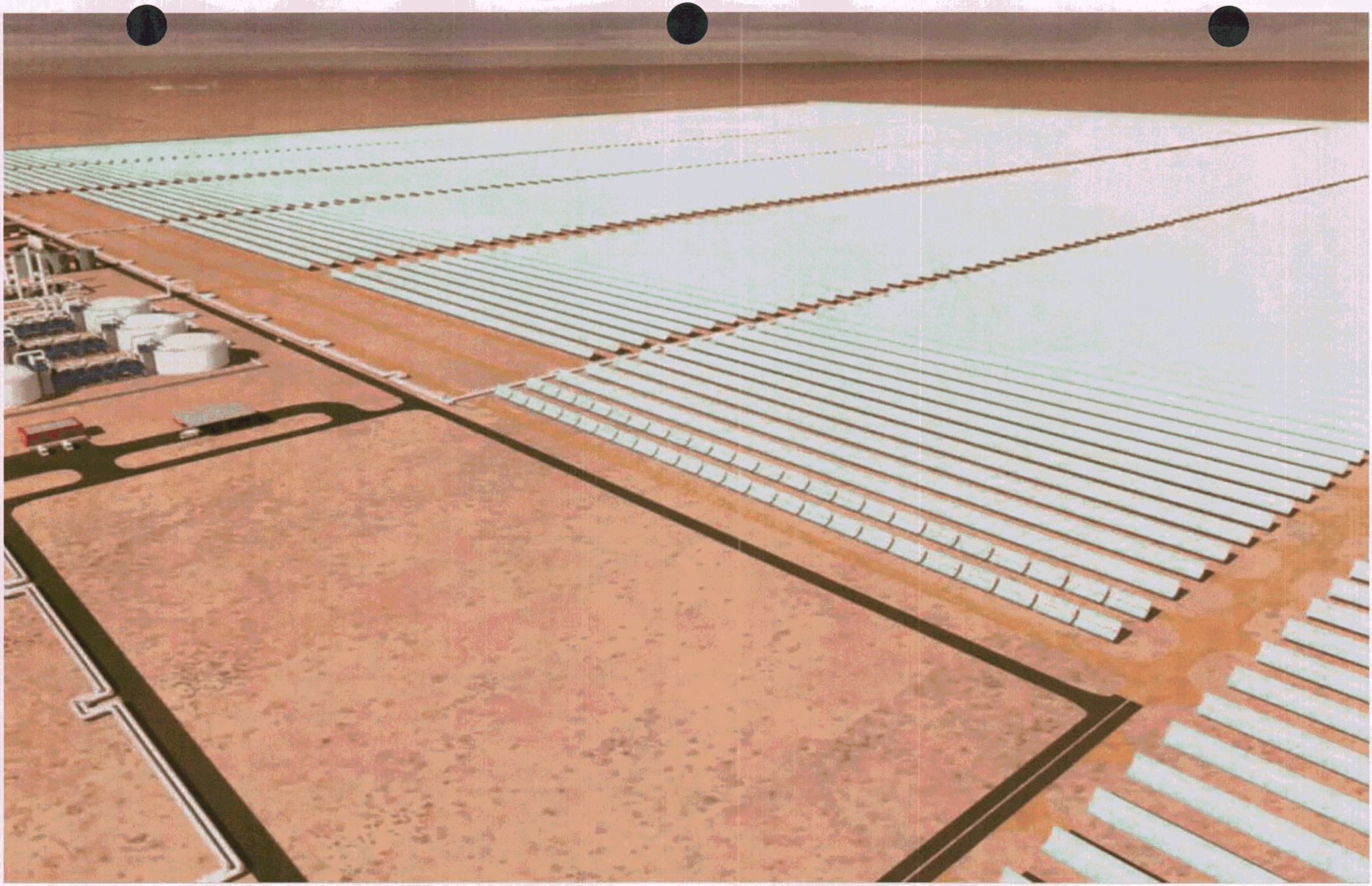
Solar Plant Rendering
Exhibit G-4



Solar Plant Rendering :
Exhibit G-5



Solar Plant Rendering (
Exhibit G-6



Solar Plant Rendering
Exhibit G-7

Typical 500kV Monopole

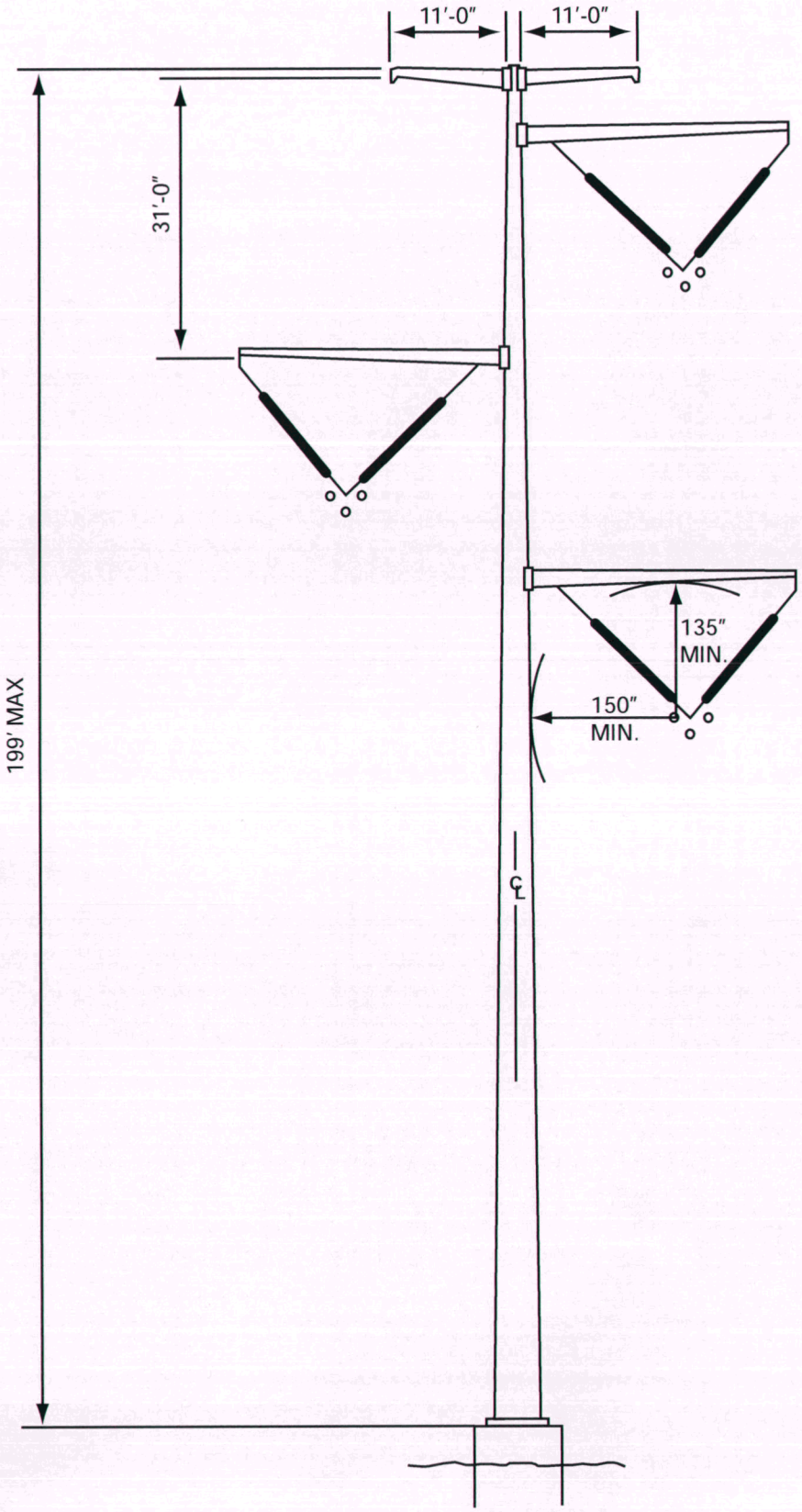


Exhibit G-8

Typical 500kV Lattice Structure

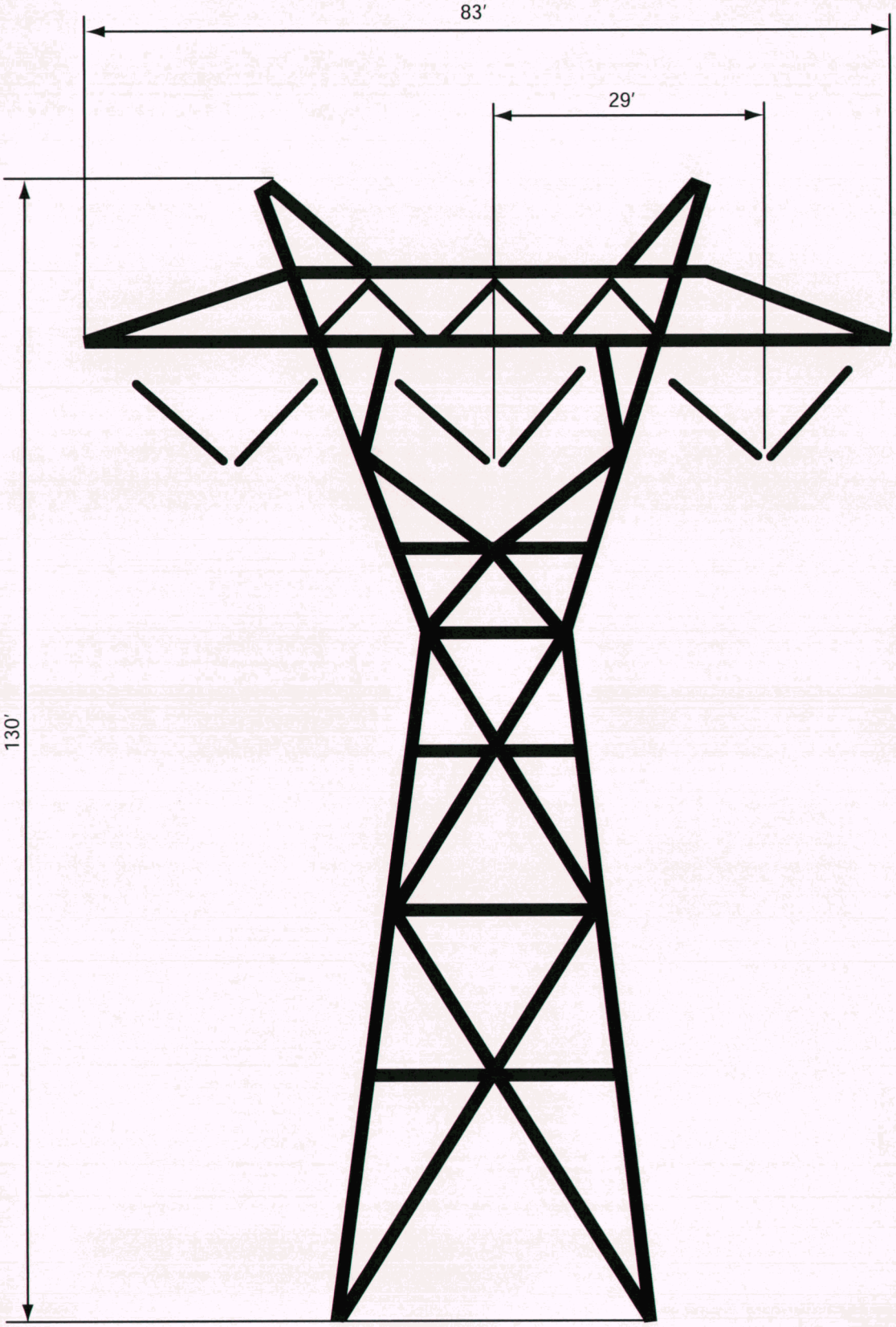
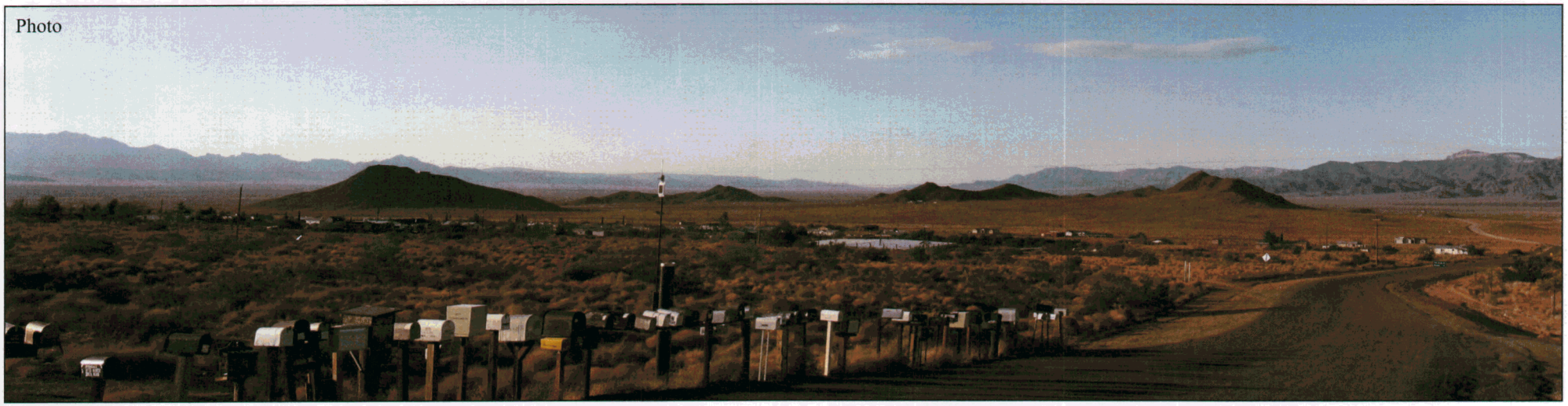
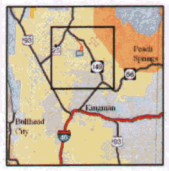


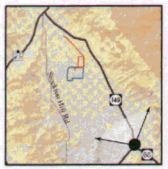
Exhibit G-9

Photo



Simulation





Route 66 - This view is from Route 66 looking northwest down Antares Road. The view is framed by the Music Mountains on the east and the Cerbat Mountains on the west. The simulation depicts the possible view to the northwest of the proposed project Site. The solar generating facility is located on the Hualapai Valley floor approximately 16 miles from this viewpoint.

Hualapai Valley Solar Project

EXHIBIT G-10

Western AREA POWER ADMINISTRATION

TRANSCON ENVIRONMENTAL

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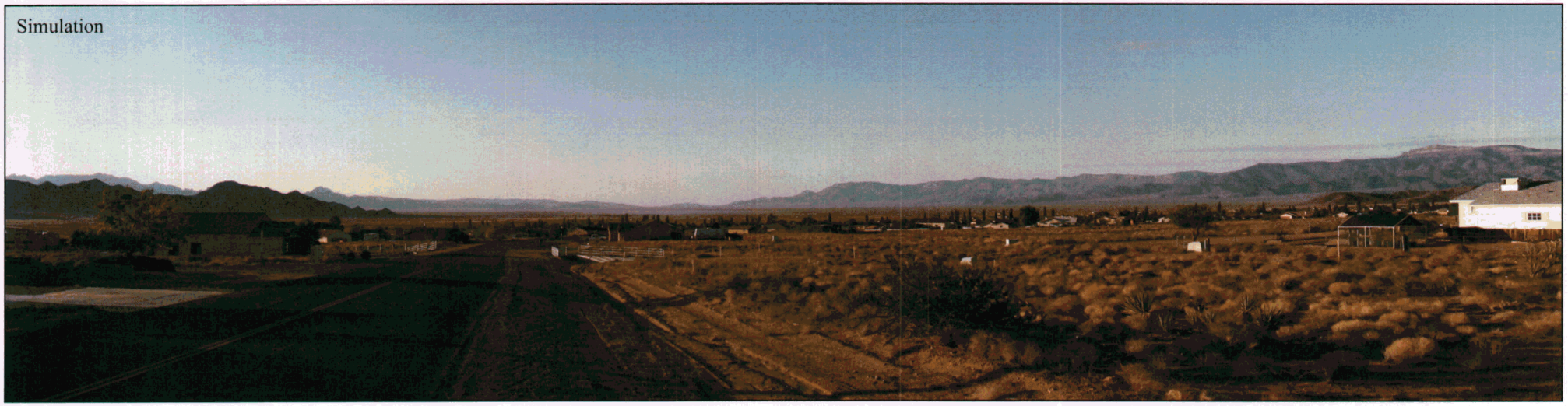
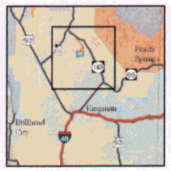
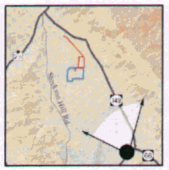
Photo

Simulation







Valle Vista - This view is from E Concho Rd in the Valle Vista subdivision looking northwest. The view is framed by the Music Mountains to the east and the Cerbat mountains to the west. The simulation depicts the possible view to the northwest of the proposed project site. The solar generating facility is located on the Hualapai Valley floor approximately 16 miles from this viewpoint.

Hualapai Valley Solar Project

EXHIBIT G-11

Western AREA POWER ADMINISTRATION

TRANSCON ENVIRONMENTAL

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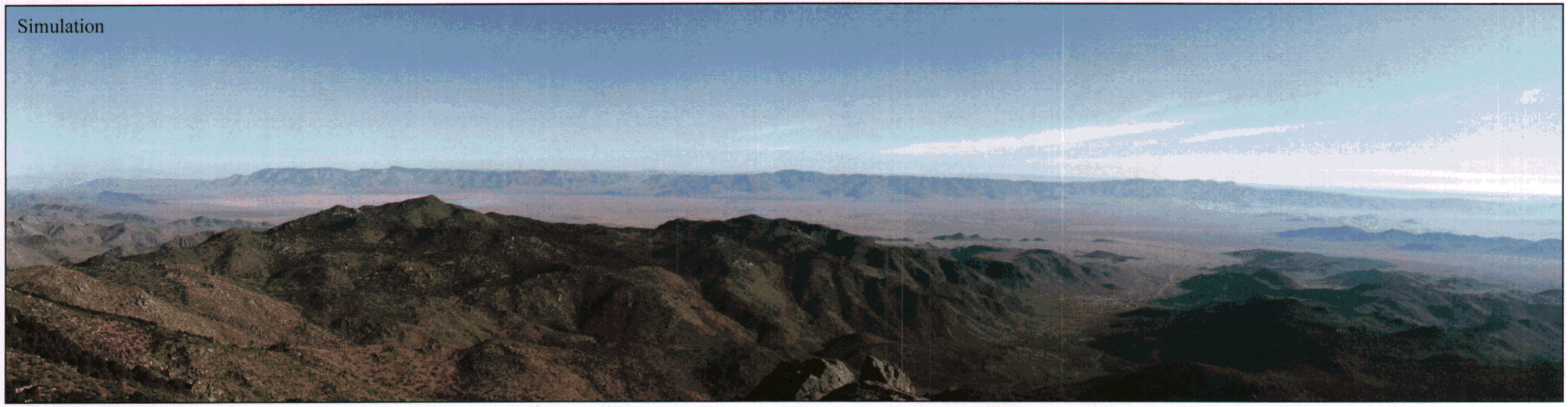
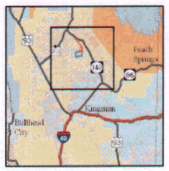
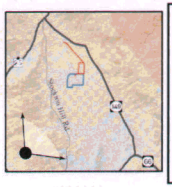
Photo

Simulation







Summit of Mount Cherum - This is a view from the top of Mount Cherum in the Cerbat Range. This view is looking northeast. The view extends from the foothills of the Cerbat Range across the Hualapai Valley floor to the Music Mountains. This simulation illustrates the possible view of the solar generating facility at a distance of approximately 14.5 miles.

Hualapai Valley Solar Project

EXHIBIT G-12

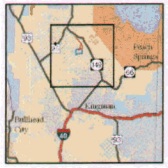
Western AREA POWER ADMINISTRATION

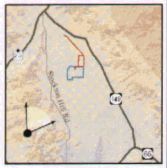
TRANSCON ENVIRONMENTAL

P:\U22-01\Graphics\Simulations\Mount Cherum

Photo

Simulation





Cherum Peak Trailhead - The trailhead is located in the Cerbat Mountains, approximately 13 miles southwest of the proposed project site. The simulation depicts a possible view to the northeast of the solar generating facility, with the Music Mountains in the background.

Hualapai Valley Solar Project

EXHIBIT G-13

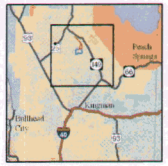
Western AREA POWER ADMINISTRATION

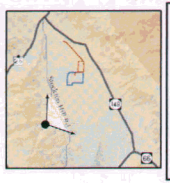
TRANSCON ENVIRONMENTAL

P:\U22-01\Graphics\Simulations\Cherum Trailhead

Photo

Simulation





Neil Ranch - This viewpoint at the base of the Cerbat Mountains looks northeast across the Hualapai Valley floor toward the Music Mountains. The simulation depicts a possible view of the solar generating facility from approximately 7 miles away.

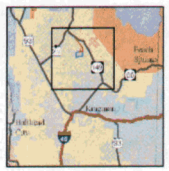
Hualapai Valley Solar Project

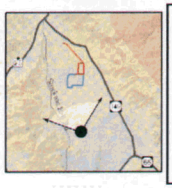
EXHIBIT G-14

Western AREA POWER ADMINISTRATION

TRANSCON ENVIRONMENTAL

P:\U22-01\Graphics\Simulations\Dance Neil Ranch





Indian Point - This view looks northeast from the south end of the Hualapai Valley floor toward the solar generating facility. This simulation depicts a possible view of the solar generating facility from approximately 7.5 miles away.

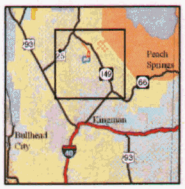
Hualapai Valley Solar Project

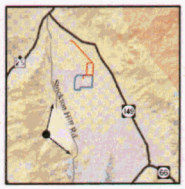
EXHIBIT G-15

Western AREA POWER ADMINISTRATION

TRANSCON ENVIRONMENTAL

P:\U22-01\Graphics\Simulations\Indian Point





26 Mile Wash Trailhead - This viewpoint is located at the base of the Cerbat Mountains, 7 miles southwest of the proposed project site. The simulation depicts a possible view to the northeast of the solar generating faciltiy, with the Music Mountains in the background.

Hualapai Valley Solar Project

EXHIBIT G-16

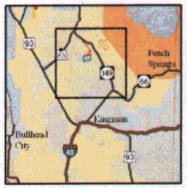
Western AREA POWER ADMINISTRATION

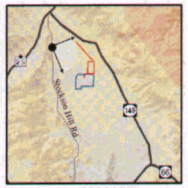
TRANSCON ENVIRONMENTAL

P:\U22-01\Graphics\Simulations\Wash 26

Photo

Simulation





Six Shooter Corral - This viewpoint located at the base of the Cerbat Mountains, 5 miles northwest of the proposed project site. The simulation depicts a possible view to the southeast of the solar generating faciltiy, with the Music Mountains in the background.

Hualapai Valley Solar Project

EXHIBIT G-17

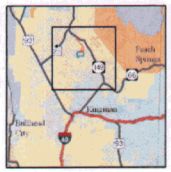
Western AREA POWER ADMINISTRATION

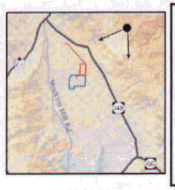
TRANSCON ENVIRONMENTAL

P:\U22-01\Graphics\Simulations\Six Shooter Corral

Photo

Simulation





Clay Springs - This viewpoint is located near the west face of the Music Mountains, approximately 11 miles northeast of the proposed project site The simulation depicts a possible view to the southwest of the solar generating facility, located within the Hualapai Valley, and the Cerbat mountains in the background.

Hualapai Valley Solar Project

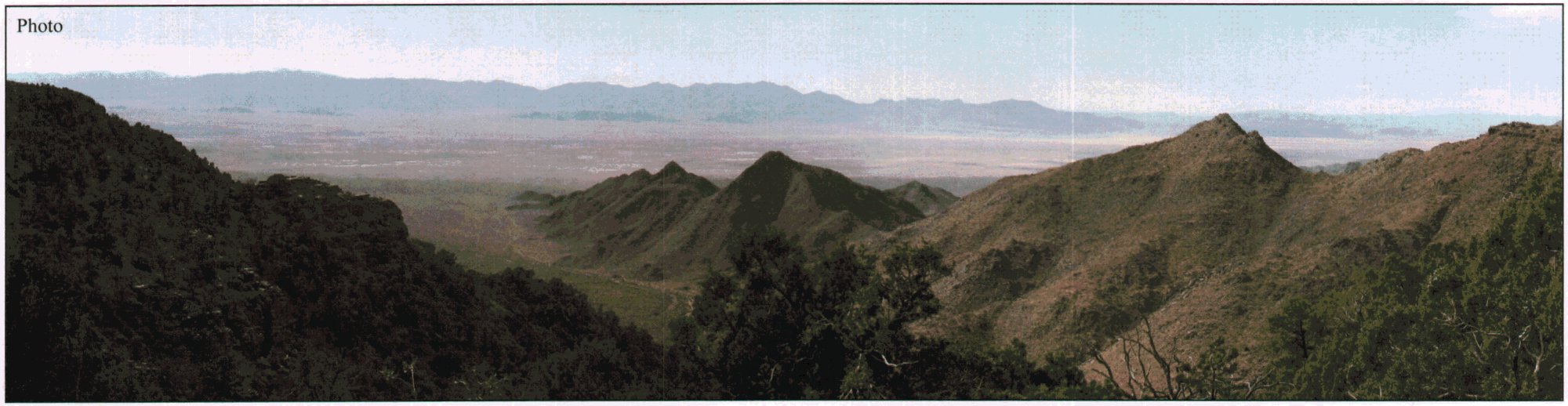
EXHIBIT G-18

Western AREA POWER ADMINISTRATION

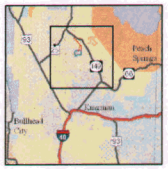
TRANSCON ENVIRONMENTAL

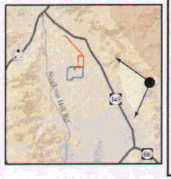
P:\U22-01\Graphics\Simulations\Clay Springs

Photo



Simulation





Coyote Springs - This view is located on the west face of the Music Mountains, approximately 10 miles southeast of the proposed project site. The simulation depicts a possible view to the northwest of the solar generating facility, located within the Hualapai Valley floor, and the Cerbat Mountains in the background.

Hualapai Valley Solar Project

EXHIBIT G-19

Western AREA POWER ADMINISTRATION

TRANSCON ENVIRONMENTAL

P:\U22-01\Graphics\Simulations\Coyote Springs

As stated in Arizona Administrative Code R14-3-219:

> *"To the extent Applicant is able to determine, state the existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site or route."*

Government Plans

The Project is located on private lands under the jurisdiction of Mohave County. The Gen-Tie and access roads cross some BLM parcels. The relevant land use plans of Mohave County for the lands in the vicinity of the Project are described in **Exhibit A**. There are no plans for development of the BLM lands.

Private Entity Plans

Residential Development

The majority of the Project site is under option by the Applicant. This land was originally intended to be developed as a Planned Area Development (PAD).[1] The PAD for the Red Lake Master Planned Community was approved by the County for residential development. Because of the Project, the Planned Community will not be built on the Project lands.

Potential Effects

Other than the Red Lake Master Planned Community, there are no planned local, state, or federal developments in the vicinity of the Project and therefore, no impacts to planned developments.

References

County of Mohave, Arizona. General Plan. March 10, 1995
Revised December 5, 2005. http://www.co.mohave.az.us/

County of Mohave, Arizona. Zoning Ordinance. Adopted: September 7, 1965
Revised: October 23, 2008. http://www.co.mohave.az.us/

[1] Of the approximately 6.5 square mile project site, 5.5 square miles had been included in the Red Lake Master Planned Community. The remaining land is private land that was not part of the planned community.

EXHIBIT I –ANTICIPATED NOISE / INTERFERENCE WITH COMMUNICATION SIGNALS

As stated in Arizona Administrative Code R14-3-219:

> *"Describe the anticipated noise emission levels and any interference with communication signals which will emanate from the proposed facilities."*

A noise evaluation was conducted to determine the potential noise impacts that would be generated from the operation of the Project. The noise that would be generated by the Project was calculated to determine what sound would be evident at the property boundary and at the nearest sensitive receptors within the vicinity of the Project.

Commonly heard sounds have complex frequency and pressure characteristics. For measuring sound levels in ordinary environments, A-weighted (dBA) correction factors are employed. The A-weighted scale is used in most common sound level (noise) ordinances and standards.

Environmental sound levels are generally described and evaluated in the following ways:

- The equivalent sound pressure level (L_{eq}) is defined as the average sound level, on an energy basis, for a stated period of time (e.g., hourly) at a given location.
- The L_{dn} is the day/night sound level that was adopted by the Environmental Protection Agency (EPA) as a measure of community sound level exposure (Crocker 1982). EPA defines L_{dn} as the average A-weighted sound level for a 24-hour period. Nighttime sound levels (10:00 PM. to 7:00 AM.) are increased by a 10 dB weighting factor, to account for the public's sensitivity to nighttime sound levels when most people are sleeping. The daytime (7:00 AM to 10:00 PM) energy average sound level is added to a weighted (+10 dB) mean nighttime level. The L_{dn} meets the EPA requirements for a description of cumulative sound level exposure, in particular the requirement that it be easily measured with simple, relatively inexpensive equipment.
- The EPA has established sound levels that are identified as protective of public health and welfare. EPA identified L_{dn} of 55 dB for residential areas as an outdoor sound level above which the public health and welfare will be affected (EPA 1974).
- Typical day-night sound levels in urban areas range from 68 to 90 dB; suburban areas average 50 dB; and rural range from 40 dB to 50 dB depending on the type of rural area.

For purposes of general comparison, **Table I-1** lists the average sound level of various sources as defined by EPA.

Table I-1 Examples of Sound Levels in dB at Various Locations	
Location	**Sound Level (dB)**
Inside an Average Residence	45
Light Traffic at 100 feet	50
Inside a Private Business	52
Inside a Large Store	60
Traffic near a Freeway	65
Normal Conversation (@ 3 feet)	65
Freight Train at 100 feet	75

Source: EPA 1974

Existing Sound

As mentioned above, typical sound levels in rural areas range from 40 dB to 50 dB. These are daytime averages and can be higher or lower depending on the presence and proximity of rural noise sources.

Noise Impacts

Noise impacts were assessed for the CSP Project because this presents the maximum noise impact. Noise generated during the construction phase of the Project would result from the operation of construction equipment and vehicles. **Table I-2** presents typical noise levels for construction equipment at a distance of 15 meters (45 feet) (Crocker 1982). These values assume the equipment is operating at full power.

Table I-2 Typical Construction Noise Levels	
Equipment Category	**Noise Level at 45 ft (dBA)**
Dump Truck	88
Portable Rock Drill	88
Concrete Mixer Truck	85
Pneumatic tool	85
Grader	85
Front-End Loader	84
Mobile Crane	83
Excavator	82
Backhoe	81
Dozer	78
Generator	78

The typical noise 45 feet from a construction site would be 85 dBA because the construction equipment can be spread throughout a construction site and may not be operating concurrently. This value and the data presented above indicate that there will be a temporary increase in ambient noise that will be limited to the construction phase of the Project. The propagation of noise depends on many factors including atmospheric conditions, ground cover, and the presence of any natural or man-made barriers. As a general rule, noise decreases by approximately 6 dBA with every doubling of the distance from the source (Bell 1982). Therefore, noise levels at various distances from the construction site can be predicted and are shown in **Table I-3**.

Table I-3
Predicted Noise Near Construction Activities

Distance from construction site (feet)	Predicted Noise Level (dBA)
45	85
90	79
180	73
360	67
720	61
1,440	55
2,880	49
5,760 (1.1 miles)	43

Construction noise generated by the Project would be intermittent in nature and would be temporary (i.e., occurring during the construction period). During this start-up and testing period, noise levels will be consistent with noise levels during operation with the exception of short periods when noise levels could be higher as a result of certain equipment tests (such as steam blows, etc).

The nearest noise receptors (residences) are over one mile from the Project site and property boundary, and over 2.5 miles from the Power Block, the main source of noise during operations. At this distance, the construction noise from the Project will be imperceptible and at or near the background levels in the area. The actual noise level at distance will vary with wind direction and velocity.

It is expected that most construction would occur during daylight hours. Some deliveries and continuous construction activities such as foundation pours will be required during non-daylight hours. During start-up and testing, performance testing will also require some continuous work but, as stated above, the noise profile associated with these activities will be consistent with operational levels. Impacts to noise are expected to be minor and short in duration.

Operations

The Project would operate during daytime hours when the sun is available to make power. Therefore, except for minimal noise that would be generated by nightly mirror washing, the Project would not affect night time sound levels.

The primary noise sources anticipated with the CSP Project are located within the Power Block area and include the cooling tower unit, circulating water pumps, boiler feed pumps, circulating pumps for the heat transfer fluid (HTF), steam turbine generator, co-firing and auxiliary boilers. Secondary noise sources are anticipated to include the transformers and miscellaneous pumps, fans, and compressors. All equipment sound power levels are based on available data from the equipment manufacturers. The estimated sound power level for each primary and secondary equipment noise source is listed in **Table I-4,** Equipment Sound Power Levels. Project equipment will be specified for equivalent "A" weighted sound pressure levels not to exceed 85 dBA at 3-feet per OSHA requirements. Should the purchased equipment have sound levels that exceed OSHA permissible noise limits (CFR 29, 1910.95), administrative or engineering controls will be utilized, such as personal protective equipment.

Table I-4
Equipment Sound Power Levels – CSP

Noise Source	dBA (at 3 feet)
Auxiliary Boiler	85
Cooling Tower	118
Transformer	85
Co-Fired Boiler	85
Circulating Water Pumps	90
HTF Circulation Pumps	92
Boiler Feed Pumps	92
Steam Turbine Generator	85

Table I-5 Predicted Noise During Operations	
Distance from Cooling Tower (feet)	**Predicted Noise Level (dBA)**
3	118
6	112
12	106
24	100
48	94
96	88
192	82
384	76
768	70
1,536	64
3,072	58
6,144 (1.2 miles)	52

The nearest noise receptors (residences) are over 2.5 miles from the Power Block, which is located at the center of the Project site and is the location of the major noise sources. At this distance, the operational noise generated from the Project will be at or near the background levels in the area.

Effect on Communications

Electromagnetic interference associated with high-voltage transmission lines can be of two types: gap noise and Corona.

AM radio is the communication medium that is most susceptible to transmission line interference. The interference will be strongest within the line right-of-way and will drop off away from the line. Objectionable interference is not expected beyond the edge of the right-of-way. FM radio is immune to corona-generated interference.

Standard television is broadcast using two different signals. The video signal is AM and is subject to interference and is not expected beyond the edges of the right of way. The audio signal is FM and is immune to coronal-generated interference. Furthermore, starting earlier this year, all television signals are broadcast with digital signals, which are immune to corona-generated interference. Cable and satellite television are also immune to corona-generated interference; therefore objectionable television interference is not expected beyond the edge of the right-of-way.

Transmission lines can cause interference to standard telephone. Telephone interference is a concern in cases where copper telephone lines are either routed on the same structures as power conductors or on separate poles within the same right-of-way.

In general microwave communication is immune to transmission line interference. The exception is where a transmission tower happens to be constructed dead center in the microwave path. If interference with analog mobile phone communications does occur, mitigation would be on a case-by-case basis. There are no private or public communications structures registered with the Federal Communications Commission (FCC) in the Project area.

Conclusions

The impact from the Project on the sound levels in the area would be minimal. All of the operational noise sources are located within the Power Block which will be surrounded by the Project's solar field providing a buffer from the noise source to any potential receptor.

Noise impacts are estimated to be less than 52 dBA at the nearest sensitive noise receptor (nearest residence) during the daytime. Therefore, noise levels produced by the Project would be similar to background noise levels for this area and operation of the Project will not have a perceptible noise impact to residences or other potential receptors in the vicinity of the Project.

This Project is not expected to generate interference with communication signals because of its remote location and because the short Gen-Tie that would be one of many lines in the area and would not be near any residences.

References

Environmental Protection Agency (EPA) 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety. Office of Noise Abatement and Control. EPA 550/9-74-004. March. Community Noise.

As stated in Arizona Administrative Code R14-3-219:

> *"Describe any special factors not previously covered herein, which Applicant believes to be relevant to an informed decision on its application."*

Public Participation Process

The Applicant has conducted an extensive Public Participation Process for the Project which included extensive outreach efforts intent on distributing information and soliciting input from the public and interested stakeholders. Additionally, the public process was conducted in association with the Mohave County Major Plan Amendment Process and the NEPA Scoping Process.

This Process included a number of different meeting types or venues that were held in order to gain public input and respond to questions and comments throughout the process.

- **Briefing Meetings:** Briefing Meetings were held with jurisdictional, planning entities and elected officials to identify issues and concerns associated with the Project. These meetings laid the foundation for working together as a team and working with the public and stakeholders on the Project.

- **Stakeholder Workshop:** A Stakeholder Workshop was held to introduce the Project to key Stakeholders and organizations in the community and designed to encourage stakeholders to provide input on the site development and Project issues.

- **Open Houses:** Three Open Houses were held in the community. These Open Houses allowed the public to have informal, one-on-one discussions with Project representatives and express concerns, provide input, and receive answers to their questions. Additionally, comment forms were available. Notice was provided through the local newspaper and individual mailings.

- **Scoping Meeting**: A joint Western/BLM scoping meeting was held as part of the Project's NEPA process.

Public Process Tools

One of the primary goals of the Process was to identify stakeholder issues and concerns. To complete this effort, a number of tools and venues were implemented.

- **Project Website:** Project Website was developed in order for the public and stakeholders to obtain information and provide comment via the website.

- **Project 1-800 number:** The Project maintains a 1-800 number that is used to respond to questions and obtain comments from the public.

- **Artist Renderings:** Artist renderings using a 3-Dimensional (3D) model of the Project was developed to provide stakeholders and the general public a sense of the size and scale of the Project.

- **Comment Forms:** Comment forms were utilized at meetings to take written comments.

- **Public Comment Tracking Database:** The Applicant has created a database for documenting contacts with the public that will be maintained through construction. Contact records identify the name, contact information, topic(s) of discussion, and follow-up action needed and taken.

  All stakeholders requesting a response have been contacted to provide the requested information. A thorough record of all contacts and response actions has been maintained.

The full Public Process Report for the meetings prior to the NEPA process includes, notices of meetings, presentation materials and handouts and public comment forms is included in **Appendix J-1.**

Appendix J-2 includes the Draft Scoping Report for the NEPA process.

EXHIBIT J-1

Hualapai Valley Solar Project
Mohave County
Citizen Participation Summary

August 2009

hualapai valley solar™
a mohave sun power project

Introduction and Purpose

Hualapai Valley Solar LLC (HVS) is developing a 340 megawatt (MW) solar-powered electric generation facility. The Hualapai Valley Solar Project (HVS Project or the Project) would use concentrating solar power (CSP) trough technology to capture the sun's heat and transfer that heat to generate steam to power traditional steam turbine generators. The Project would include a dispatchable thermal energy storage system. In addition, the Project would include an electric transmission line and substation site to interconnect with the regional electric transmission grid.

The purpose of this document is to summarize the outcome of the Citizen Participation Program (CPP) for the HVS Project through the August 6, 2009 meeting in Dolan Springs. The CPP was developed specifically to meet the Mohave County Section 40.2 Citizen Participation Plan Requirements for Amendments to the General Plan and Area Plans and was approved by Mohave County.

The HVS Project conducted a series of meetings and Open Houses in June, July and August 2009. Over 250 people attended these meetings and Open Houses. They were held in various formats to engage the public, allow for public comment and questions, and allow for maximum input possible. The following sections include a summary of these meetings and Open Houses, and Appendices have been included to provide details.

Key Stakeholder Meeting

A Key Stakeholder Meeting was held on June 30, 2008 from 11:00 a.m. to 1:00 p.m. at the Hampton Inn in Kingman. The following were invited to this meeting: city and county officials; state and federal agencies; utilities; school districts; regional planning agencies; and local civic, educational and professional organizations. This purpose of this meeting was to provide project information and provide an opportunity to obtain comments from key stakeholders. A complete list of the invitees, the meeting invitation, the agenda, the meeting handouts, meeting sign-in sheets, presentation, and comment forms received are included in **Appendix A.**

Fifty-five people attended this meeting, including many from the general public. It started with a presentation by the Project, then was followed by question and answer format. Because of the large turnout, HVS modified the agenda and stayed in the larger Q&A group as the group wanted this type of format instead of breaking into small discussion groups as planned. Below is a summary of organizations represented and agenda and comments received verbally and documented on flip charts.

Attendance:

55 people attended the meeting, the following organizations were represented:

- Arizona Department of Transportation
- Highway 93 Advisory Group South
- Northern Arizona Consolidated Fire District
- City of Kingman
- Unisource
- Northwest Arizona Watershed Council
- Hualapai Tribe
- Bureau of Land Management
- Arizona Land Quest

- Mohave Integrity
- Kingman Chamber of Commerce
- News Media
- Turn-2-Solar LLC
- Arizona Game and Fish
- Western Area Power Administration
- Mohave County
- Eagle Realty
- Kingman Daily Miner
- Kingman Downtown Merchants
- SRC
- Local Drought Impact Group
- Kingman Airport Authority
- SVS

AGENDA/COMMENTS:

Welcome and Introductions

Presentation of the Project

Open Forum for Comments and Questions (overall group)

The following comments and questions were documented on flip charts that were hung around the room. Most of the comments and questions were from the general public.

- Can you use effluent water usage- 1.5 Million gallons per day is from new Kingman WWTP
- Breakdown of Jobs
  - Construction
  - Operation
  - Level of Education and Pay
- Explain why you cannot utilize Dry Cooling
- We want Dry Cooling
- Who did the Geologic Report – It is Private Report
  - Need USGS Report
- Water- Why is it different from Other Projects
  - Albiasa 4k acre feet water
  - Our project 1.5-3k
- If Dry Cooling Cost More, Pass the Cost on and use Dry Cooling
- Category Jobs-
  - Education necessary for jobs
- Better facts on water-
  - How much in Arizona and in Our Aquifer
  - How much will the Project use
  - Flow Chart to present this info
- Why Not Hybrid Cooling Option
- EIA/EIS- height impacts need to be discussed
- Executive Director Background
  - Sanctions (would like documents)
- Decommissioning of the Project—do not leave like NJ
- Brine Ponds/ Salt—what happens and how does it work
- Ownership/ Financing

    - US Ownership Finance
- Mohave County
    - Gain in local economy from jobs
    - Merchant generation has been an issue, Griffith
    - Different from merchant
    - Fuel prices
- How much water does City of Kingman use -- confirm 6,000 – 8,000 acre feet
- Tribal Historic Preservation Officer – Sacred Property at Red Lake, TCPs and other sacred sites
- Sacred site on Red Lake
    - Look at underground storage projects that were completed in past
    - Eligible NRH Places – BLM coordination
- Jobs – special education for jobs
- Positive- Jobs, infrastructure
- Export electricity to CA
    - 2004 Report Mohave County by Ron Walker
- Presentation online (yes)
- Bar Chart in Presentation- not fair comparison of specific projects
- General Plan – wet cooling not allow
- Economics - per kWh
    - 30 – 50% increase cost per kWh
    - Source analysis for transmission
    - Transmission study
- Water – How much in Aquifer
    - Issue- need to use dry cooling
- Cost/Funding
- Hear County Manager on water uses (ex. Griffith)
- Employment Profile
- Monsoon
    - Rainwater collection
- Vernal pool
- Recharge # ADWR 2006
- Storage Tanks
    - Explosion

Open Houses

Two Open Houses conducted in July and one in August. Over 190 people attended the three Open houses which were held from 5:00 p.m. to 7 p.m. in Valle Vista, Kingman and Dolan Springs. These Open Houses allowed the public to have informal, one-on-one discussions with Project representatives and express concerns, provide input, and receive answers to their questions. Additionally, comment forms were distributed. Notice was provided through the local newspaper and individual mailings as per the approved CPP. The Open House mail notices, newspaper advertisements, sign-in sheets and boards that were presented at the Open Houses are included in **Appendix B.**

Valle Vista Golf Course
July 15, 2009

Attendance:

91 people attended the Open House and the following organizations were represented:

- *93 AGS*
- *ABOVE ALL REALTY*
- *ARIZONA STATE UNIVERSITY*
- *DES EA*
- *DONE RIGHT ENGINEERING*
- *EAGLE REALTY*
- *ENVIRONMENTAL PLANNING GROUP*
- *FERGUSON*
- *KINGMAN DAILY MINER*
- *LAIZON INC.*
- *LARON CORP.*
- *MCA*
- *MOUNTAIN VISTA*
- *NORTHWEST ARIZONA WATERSHED COUNCIL*
- *SVS*
- *VALLE VISTA*

Comment Summary
Commented that individual is happy with solar, and states – "just do it right". Requests for the project to explore opportunities for reuse/recycle evaporative salts. Request water usage to be recycled as much as possible. Concern for impacts on wildlife in the area; would there be opportunities to create a sanctuary for wild horses, deer or antelope? Individual noted that they've seen flooding on Pierce Ferry Road. Interested if there could be impacts to Stockton Hill Road?
Commented that out of water/salt/oil resources, water is the big problem. Questioned what salts are to be used, where will they come from, and how much. Also questioned what oil is to be used, what kind, and how much. Suggests the project go dry cooling and photovoltaic so you are not using the local natural resources. Individual notes that he has lived on solar/wind for 20 years. It is different but certainly feasible with no water use.
Commented that the statement "not in my back yard" is the bane of every power company - until the rolling brown outs start. Questioned how much of the power generated by the facility would stay in the local community?
Local activist for solar power and water reuse provided full page comment letter commenting on options for the water needed for the project and the possibility of incorporating waste water into the project design.
Commented to check in to Priem Power Plant and its use of dry cooling.
Commented that the open house was a very poor presentation to the public. Questions and answers asked by the public to the representatives everyone knows what is going on. Suggested not to use divide and conquer methods.
Requested the location of the proposed transmission line and the GPS coordinates.

Kingman High School
July 16, 2009

Attendance:

65 people attended the Open House and the following organizations were represented:

- *AD*
- *ARIZONA GAME AND FISH DEPTARMENT*
- *BUREAU OF LAND MANAGEMENT*
- *DESERT DREAMS, LLC*
- *EAGLE REALTY*
- *GREEN TEAM*
- *KINGMAN HIGH SCHOOL*
- *MOHAVE COUNTY*
- *MOHAVE COUNTY DEVELOPMENT SERVICES*
- *MOHAVE COUNTY ONE STOP*
  - *COYOTE PROGRAM*
- *PRUDENTIAL R.E.*
- *RESIDENTS AGAINST IRRESPONSIBLE DEVELOPMENT (R.A.I.D.)*
- *SRC*
- *SVS*
- *TRI-STATE*
- *WIND MILL RANCH*

Comment Summary
Water usage: commented on depletion of the already compromised aquifer. Questioned why is the project duration only 25-30 years? Would this duration be greater if the project utilized dry cooling instead of wet cooling? Questioned if there is a way to make project component replacements or upgrades to the mirrors? Questioned how much of the generated energy would be sold to Mohave County? Also, would this drive up local prices if the Applicant sells the energy to the "highest bidder"? For example if the energy is sold to Nevada or California, Mohave County may be unable to compete. Would like a formal Q&A session with the project representatives and experts responding to the citizen's Q&A. The open house presentation at the Valle Vista clubhouse was unfair and biased. The attendees were not able to hear everyone's individual comments.
Three comments in agreement with this solar project.
One comment received with no comment, but individual provided contact information for future project correspondence.
Commented that since there always seems to be skeptics that need to have everything proven feasible; questioned whether it would be cost effective to build portions of the project at a time, and therefore showing the water usage to be minimal; and then continue building portions, etc.? Questioned how many miles of additional transmission lines need to be installed? Requested to be kept informed about upcoming project information classes and employment opportunities. Requests to be involved in any project employment position and individual has many skills that can be used (such as material handling/logistics and special projects).
Commented that this is a great project location. Would also like to be on the list for the future job openings.

Dolan Springs
August 7, 2009

Attendance:

42 people attended the Open House and the following organization was represented:

- *LABOR READY*

Comment Summary
Access Road to make community closer 21st/23rd Street- last street to BLM land Make easier to distance
Are you hiring labor on operation? One person commented about a map 6 miles West of Stockton on Pierce Hwy
One gentleman commented that he liked the project and its technology and its capabilities. He do not want to outsourced material, jobs, etc. The manufacturing of materials should be from the US and most of the permanent jobs should be from the local population. He wants the technology to stay up to date and that is only concern. He said when making a determination for jobs, he would like to be considered. He has Behavioral of Science Degree in Industrial Technology. With a minor in Management. He reads blueprints and runs crews in the entertaining and rigging field.
Interested in employment- equipment operator, welder and has own welding equipment. All types of welding.
Another gentleman commented that he is all for it and is a heavy lift rigger looking for work.
Another person wants to know what vacuum will the low pressure turbine exhaust to be condensed? He also said- Your projected water use is astronomical and not appropriate for this area. It sounds like you will suck the water right out from under my well.
One lady asked- How much water are you using? Why? What happens if local water wells start going dry? Who is responsible? Are you going to recycle the water? Are you going to rebuild a pipeline and use effluent from Kingman waste water?
Jobs
No comments or concerns- Get it started!
Issue local hiring and training.

Additional Public Process Tools

The Applicant had additional public process tools in order to identify stakeholder issues and concerns. The following have been implemented:

- **Photographic Simulations:** Photographic simulations using a 3-Dimensional (3D) model of the HVS Project were developed and provided at the meetings and Open Houses as well as located on the website. These provide stakeholders and the general public a sense of the size and scale of the Project.

- **Comment Forms:** Comment Forms were utilized at meetings to take written comments. We also have mail in comment forms. All comment forms received from all the meetings and that have been mailed in are included in **Appendix C.**

- **Public Comment Tracking Database:** The Applicant has created a database for documenting contacts with the public that will be maintained through construction. Contact records will identify the name, contact information, topic(s) of discussion, and follow-up action needed and taken.

Appendix A:

Stakeholder Meeting Materials

Invitation	Name	Title	Representing	Address	Town/ City	Email	Phone
Yes	Honorable Wilfred Whatoname, Sr.	Chairman	Hualapai Tribe	941 Hualapai Way	Peach Springs, AZ 86434		(928) 769-2216
cc	Jack Ehrhardt	Planning Dept. Director	Hualapai Tribe	941 Hualapai Way	Peach Springs, AZ 86434		(928) 769-2216
cc	Loretta Jackson-Kelly	Cultural Dept. Director	Hualapai Tribe	941 Hualapai Way	Peach Springs, AZ 86434		(928) 769-2223
Yes	Honorable Trent Franks	Congressman	Arizona's 2nd Congressional District	2435 Rayburn House Office Building	Washington, DC 20515		(202) 225-4576
Yes	Honorable John Salem	Mayor	City of Kingman	310 North Fourth Street	Kingman, AZ 86401	jsalem@cityofkingman.gov	(928) 753-5561
Yes	Jack Kramer	City Manager	City of Kingman	310 North Fourth Street	Kingman, AZ 86401	jkramer@cityofkingman.gov	(928) 753-5561
Yes	John Holt	Environmental Manager	Western Area Power Administration	PO Box 6457	Phoenix, AZ 85005-6457	holt@wapa.gov	(602) 605-2592
cc	Mary Barger	Environmental Specialist	Western Area Power Administration	PO Box 6457	Phoenix, AZ 85005-6457	barger@wapa.gov	(602) 605-2524
cc	John Steward	Operations Support Specialist	Western Area Power Administration	PO Box 6457	Phoenix, AZ 85005-6457	steward@wapa.gov	(602) 605-2774
cc	Scott Florence	District Manager	BLM, Arizona Strip District	345 East Riverside Drive	St. George, UT 84790-6714	ASFOWEB_AZ@blm.gov	(435) 688-3200
Yes	Ruben Sanchez	Field Manager	BLM, Kingman Field Office	2755 Mission Boulevard	Kingman, AZ 86401-5308	KFOWEB_AZ@blm.gov	(928) 718-3700
Yes	Ron Walker		Mohave County	3675 E. Andy Devine Avenue	Kingman, AZ 86401		
cc	Mike Hendrix		Mohave County	3675 E. Andy Devine Avenue	Kingman, AZ 86401		
cc	Nick Holt		Mohave County	3675 E. Andy Devine Avenue	Kingman, AZ 86401		
cc	Christine Ballard	Acting Director	Mohave County Development Services Depa	3675 E. Andy Devine Avenue	Kingman, AZ 86401		(928) 757-0903
cc	Kevin Davidson		Mohave County Development Services Depa	PO Box 7000, 3675 E. Andy Devine Avenue	Kingman, AZ 86402-7000		
Yes	Micheal File	Superintendant	Mohave County School District	PO Box 7000	Kingman AZ		
Yes	Matthew J. Smith	Mohave County Attorney	Mohave County	315 N. 4th Street	Kingman, AZ 86401		(928) 753-0719
Yes	Dr. Johnathon Fink	University Sustainability Officer	Global Institute of Sustainability	PO Box 875402	Tempe, AZ 85287	JONATHAN.FINK@asu.edu	(480) 965-4797
Yes	Roger Clark	Air & Energy Director	Grand Canyon Trust	2601 N. Fort Valley Road	Flagstaff, AZ 86001	rclark@grandcanyontrust.org	(928) 774-7488
cc	Sandy Barr	Conservation Outreach Director	Sierra Club -Grand Canyon Chapter	202 E. McDowell Rd., Ste. 277	Phoenix, AZ 85004	sandy.bahr@sierraclub.org	(602) 253-8633
cc	Jon Findley	Energy Chair	Sierra Club -Grand Canyon Chapter	202 E. McDowell Rd., Ste. 277	Phoenix, AZ 85004	energy@grandcanyon.sierraclub.org	(480) 756-2916
Yes	Jim Vaaler	Chair	Sierra Club -Grand Canyon Chapter	202 E. McDowell Rd., Ste. 277	Phoenix, AZ 85004	jimvaaler@msn.com	(602) 553-8208
Yes	Pam Eaton	Deputy VP Public Lands Campaign	The Wildernesss Society	1660 Wynkoop Street, Suite 850	Denver, CO 80202	pam_eaton@tws.org	(303) 650-5818
Yes?	Laura Sanchez	Energy Solutions Policy Fellow	Natural Resources Defense Council	PO Box 287	Albuquerque, NM 87103	nrdcinfo@nrdc.org	(505)352-7408
Yes	David Berry	Energy project Senior Policy Advisor	Western Resource Advocates	P.O. Box 1064	Sottsdale, AZ 85252	azbluhill@aol.com	(480) 990-7209
Yes			Nature Conservancy	The Plaza at Squaw Peak III, 7600 N. 15th St.' #100	Phoenix, AZ 85020	arizona@tnc.org	(602) 712-0048
Yes	Laura Sanchez	Energy Solutions Policy Fellow	Natural Resources Defense Council	PO Box 287	Albuquerque, NM 87103	lsanchez@nrdc.org	cell (505) 401-9441
Yes	Amanda Ormand		Interwest Energy Alliance	7650 S. McClintock Drive, Suite 103-282	Tempe, Az 85284		
Yes	Eric Gorsegner	Associate Director	Sonoran Institute	4835 E Cactus Road, Suite 270	Scottsdale, AZ 85254	egorsenger@sonoran.org	(602) 393-4310
Yes	Sam Campana	Executive Director	Audubon Anzona	4250 East Camelback Road, Suite K310	Phoenix, AZ	SamCampana@aol.com	(602) 468-6470
Yes	Elno Roundy	Chairman	Northwest AZ Watershed Council	PO Box 3222	Kingman, AZ 86402		(928) 757-2818
cc	Denise Bensusan		Northwest AZ Watershed Council	PO Box 3222	Kingman, AZ 86402		(928) 757-2818
Yes	Larry Voyles	Director	Arizona Game and Fish Department	5000 W Carefree Hwy	Phoenix, AZ 85086		(602) 942-3000
Yes	Eunice Blevins		Cerbat Ridge Runners ATV Club	3880 Stockton Hill Road 103-101	Kingman, AZ 86409	ebbie@citilink.net	(928) 757-2900
Yes	Marty Helton		Walapai 4-Wheelers	PO Box 4004	Kingman, AZ 86402		(928) 753-5360
Yes	Joshua Noble	President	Kingman Mohave Lions Club	PO Box 4316	Kingman, AZ 86402-4316		(928) 753-4505
Yes	Lawerence Carver	Exalted Ruler	The Benevolent & Protective Order of Elks Lc	Kingman, AZ No. 468; 900 Gates Avenue	Kingman, AZ 86401-4072	elks468@frontiernet.net	(928)753-3557
Yes	Robin Grumbles	Director	Mohave County Cooperative Extension	101 E. Beale Street, Suite A	Kingman, AZ 86401-5808	grumbles@cals.arizona.edu	(928) 753-3788
Yes	Earl Engelhardt	AWA Executive Committee Member	Northwest AZ Watershed Council	6125 East Westwind Road	Kingman, AZ 86401	imspirit@kingmanaz.net	(928) 692-1068
Yes	Anthony Martinez	Permits Supervisor	Arizona Department of Transportation, Kingm	3660 E. Highway 66	Kingman, AZ 86401-3453		(928) 681-6019
Yes	Roy Tanney		Arizona Department of Real Estate	2910 North 44th Street, Suite 100	Phoenix, AZ 85018		(602) 468-1414
Yes	Jamie Hogue	Deputy Commissioner	Arizona State Land Department	1616 W. Adams Street	Phoenix, AZ 85007		(602) 542-4631
Yes	Robert Posey	Regional Supervisor	Arizona Game and Fish Department	5325 North Stockton Hill Road	Kingman, AZ 86401		(928) 692-7700
Yes	Douglas W. Dunham	Manager of the Office of Assured and Adequa	Arizona Department of Water Resources	500 North Third Street	Phoenix, AZ 85004-3903		(602) 417-2400
Yes	Marjorie Blaine	Senior Project Manager	U.S. Army Corps of Engineers	5205 East Comanche Street, Davis-Monthan AFB,	Tucson, AZ 85707		(520) 584-1684
Yes	Tom Duranceau	Planning Manager	City of Kingman	310 North Fourth Street	Kingman, AZ 86401	tduraceau@cityofkingman.gov	(928) 753-8130
Yes	Beverly Liles	President	Kingman Area Chamber of Commerce	120 W. Andy Devine, PO Box 1150	Kingman, AZ 86402-1150	kgmncofc@ctaz.com	(928) 753-6253
Yes	Robert Riley		Kingman Airport Authority	7000 Flightline Drive	Kingman, AZ 86401		(928) 757-2134
Yes	Dale Bailey		Partnership for Economic Development	314 London Bridge Road	Lake Havasu City, AZ 86403	www.lakehavasu.org	(928) 505-7333
Yes	Carlos Tejada	Director	Mohave Electric Cooperative	PO Box 1045	Bullhead City, AZ 86430		(928) 758-0580
Yes	Dave Estenson		Lake Mohave Ranchos Fire Department	PO Box 611	Dolan Springs, AZ 86411		
Yes	Pat Moore	Fire Chief	Northern Arizona Consolidated Fire District #	2470 Butler Avenue	Kingman, AZ 86409		(928) 757-3151
Yes	Mike Gibelyou	Right-of-Way Specialist	Unisource Energy Services	2498 Airway Avenue, PO Box 3099	Kingman, AZ 86402-3099		(928) 681-4100
Yes	Harley Pettit		RAID Residents Against Irresponsible Development			kingmanraid@yahoo.com	
Yes	Janice Alward	Chief Counsel	Arizona Corporation Commission	1200 W. Washington	Phoenix, AZ 85007-2996		
Yes	Patrick Cunningham	Acting Director	Arizona Department of Env Quality	1110 W. Washington Street	Phoenix, AZ 85006	Cunningham.Patrick@azdeq.gov	(602) 771-2260
Yes	James Garrison	State Historic Preservation Officer	AZ State Historic Preservation Office	Arizona State Parks, 1300. W. Washington Street	Phoenix, AZ 85007		(602) 542-4009

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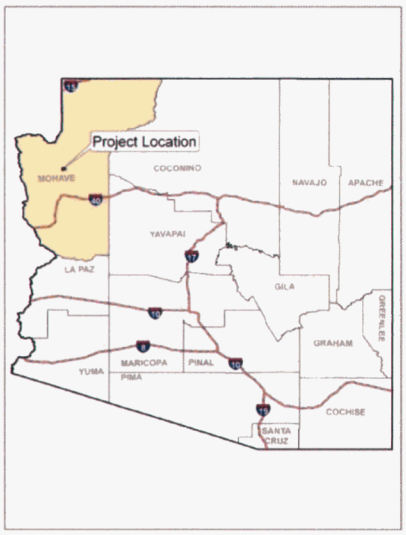
Hualapai Valley Solar Project

STAKEHOLDER MEETING

Hualapai Valley Solar LLC is conducting an informational meeting for key stakeholders (agencies, officials and local organizations) to learn about the project and discuss project issues. Representatives of the project will be available to answer questions, provide information, and discuss stakeholder issues.



Location: Hampton Inn
1791 Sycamore Ave
Kingman, Arizona
Date: June 30, 2009
Time: 11:00 am – 1:00 pm

What is the Hualapai Valley Solar Project?

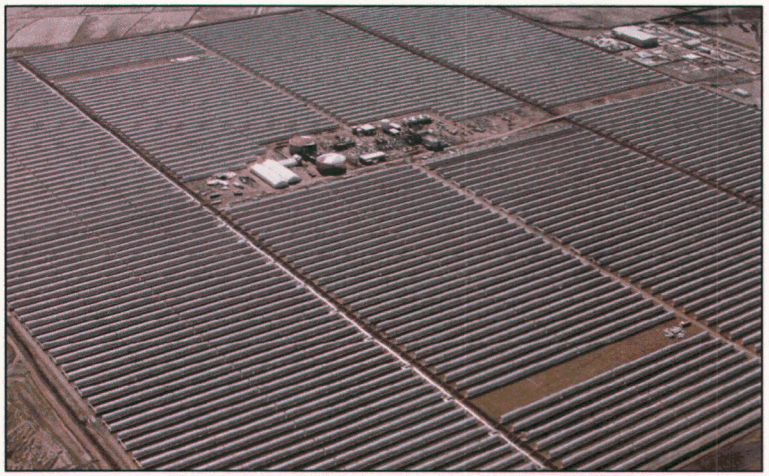
The Hualapai Valley Solar Project (HVS Project) is a 340 MW solar electric generating plant that will be located approximately 27 miles north of Kingman near Red Lake. The HVS Project will use concentrating solar power (CSP) technology coupled with the ability to store energy during non-sunlight hours, to better meet renewable energy standards.

Please join us or send a representative from your organization. We welcome your input and hope you can join us.

Lunch will be served.
Please RSVP to Mariah Lownds at 480-491-2230 or
mlownds@tierra-ec.com.

Learn More and Comment on the HVS Project
www.hualapaivalleysolar.com
1-877- 487-1437

Please visit the Project Website or call the toll-free number to learn more about this project and how to become involved. The HVS Project team invites feedback, concerns, and questions.



Aerial view of a CSP plant.

Hualapai Valley Solar LLC
Phone: 1-877-487-1437
Website: www.hualapaivalleysolar.com

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HUALAPAI VALLEY SOLAR PROJECT

JUNE 2009

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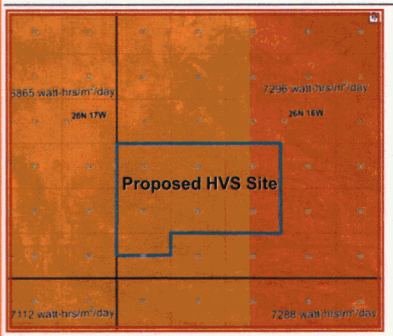
Hualapai Valley Solar LLC proposes to construct a 340-megawatt (MW) concentrating solar power (CSP) plant in Mohave County, Arizona, approximately 27 miles north of Kingman. would use a proven technology that has been operational in the United States since the 1980's. The HVS Project site is located on 4,000 acres of private land.

Artist's rendition of the Hualapai Valley Solar Project.

Need for the HVS Project

Arizona has an abundance of solar power potential that can help meet many needs.

- Additional power must be generated to meet electricity demand, which is expected to increase by 26% between 2009 and 2030 (reported by the U.S. Energy Information Administration, March 2009)
- Several Western States have identified Renewable Energy Standards (RES), for example:
  - Arizona = 15% by 2025
  - California = 33% by 2020
  - Nevada = 20% by 2015
- President Obama identified a goal of doubling renewable energy production in the next three years (February 24, 2009, State of the Union Address)
- Production of renewable energy results in significantly lower green house gas emissions and a smaller carbon footprint compared with traditional fossil fueled power plants



Source: National Renewable Energy Laboratory

The Ideal Solar Site

The following characteristics associated with the HVS Project site make it ideal for a solar project:

- High **incoming solar radiation** (insolation) value
- Minimal slope
- Proximity to electric grid
- Water availability
- Proximity to transportation corridors
- Available land

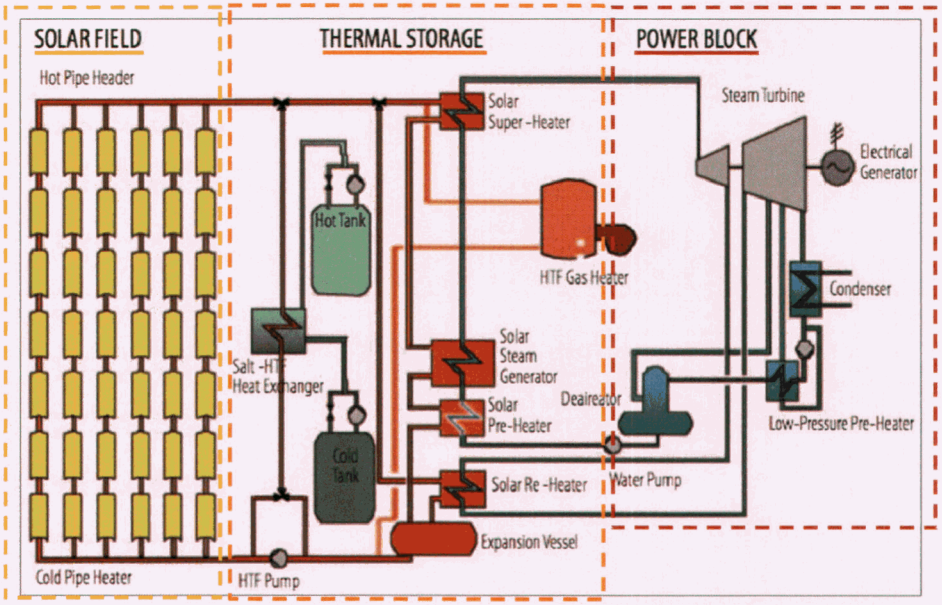
How Will the HVS Project Work?

The HVS Project will use CSP technology to capture heat generated by sunlight and turn that heat into electricity. The HVS power plant will be composed of three main components (represented in the facility diagram, below):

- **Solar Field** — The solar field is composed of several rows of parabolic-shaped mirrors. The mirrors are tilted toward the sun to catch as much sunlight as possible. The curvature of these mirrors focuses the sunlight on a central receiver tube that runs the length of the mirror. The central receiver tubes are hollow and filled with a heat transfer fluid (HTF). The HTF is warmed by the sunlight and flows to the power block or the thermal energy storage system depending on the mode of operation.
- **Power Block** — Hot HTF is transported to the power block where it is used to boil water in a conventional steam generator to produce electricity.
- **Thermal Energy Storage System** — Hot HTF is also transported to molten salt storage tanks. The heat from the HTF is transferred to the salt tanks where it can be stored for later use. This process allows electricity to be produced on cloudy days or after sunset.

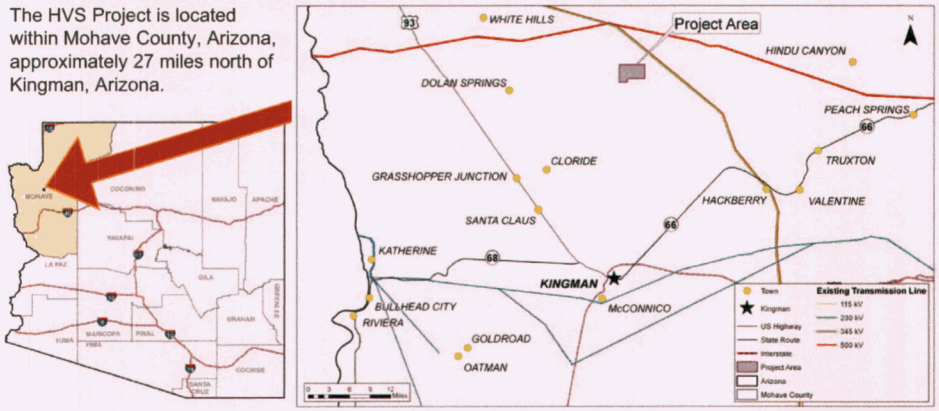
Solar energy is a renewable resource and is constantly replenished. Whereas, fossil fuel (coal, oil, and natural gas) resources are limited and subject to market pricing and volatility

Facility Diagram



Project Location

The HVS Project is located within Mohave County, Arizona, approximately 27 miles north of Kingman, Arizona.

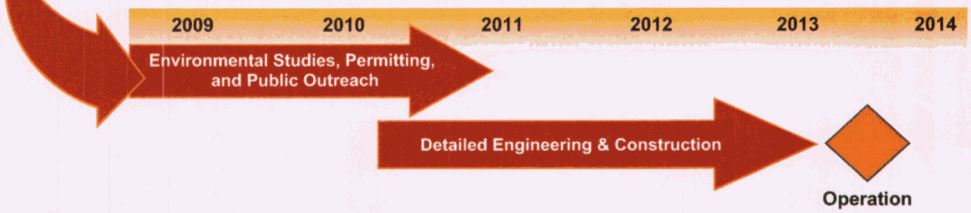


The HVS Project will require Federal, State, and local permits and approvals. The permitting process is currently underway.

Permits / Approvals — Agency

Arizona Certificate of Environmental Compatibility — Arizona Corporation Commission
Air Permit — Arizona Department of Environmental Quality
Aquifer Protection Permit — Arizona Department of Environmental Quality
Right-of-Way — Bureau of Land Management (NEPA)
Grant Interconnection Request — Western Area Power Administration (NEPA)
Land Use/Zoning — Mohave County

HVS Project Timeline



Agenda

11:00	Welcome and Introductions
11:15	Overview of the Project Project Overview Solar Technology Site Details and Environmental Aspects Process and Schedule
11:30	Round Table Discussions (20 minutes per table) Project Site, Environmental Technology, Project Descriptions Water
12:45	Overview of Group Discussions and Comments

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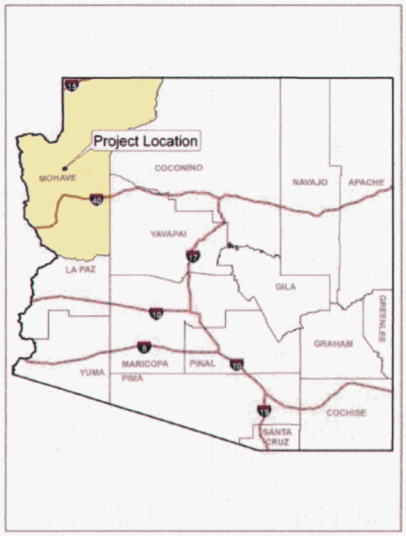
Open House Meetings



Hualapai Valley Solar LLC is conducting its first two Open House Meetings in mid July to present the Hualapai Valley Solar Project (HVS Project) and discuss project issues. The HVS Project is a 340 MW solar electric generating plant that will be located approximately 27 miles north of Kingman near Red Lake. The HVS Project will use concentrating solar power (CSP) technology coupled with the ability to store energy during non-sunlight hours, to better meet renewable energy standards.

Representatives of the project will be available to answer questions and provide information. We welcome your input and hope you can join us at an Open House meeting. The same information and representatives will be available at both meetings. It is an Open House format and you can come anytime. An RSVP is **not** necessary. If you have questions please call 1-877-487-1437 or visit our website at *www.hualapaivalleysolar.com.*

Date: **July 15**
5:00 – 7:00 p.m.
Valle Vista Country Club
9686 N Concho Drive
Kingman, AZ 86401

Date: **July 16**
5:00 – 7:00 p.m.
Kingman High School
4182 Bank St.
Kingman, Arizona 86409

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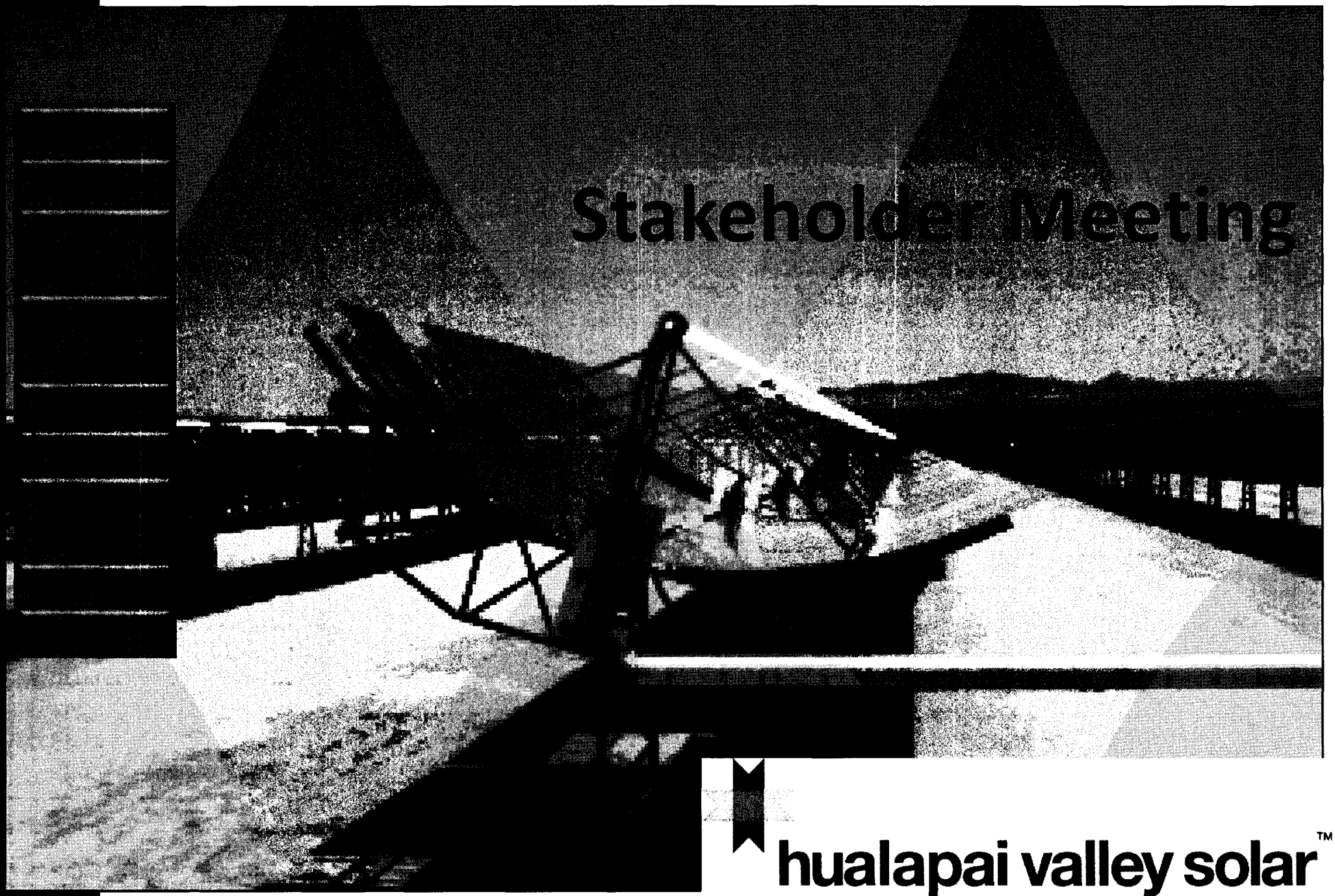
2701 E Andy Devine Avenue - Suite 300
Kingman, AZ 86401

Resident Address

PLEASE ATTEND AN OPEN HOUSE



Stakeholder Meeting

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Process

- **This is only the first step in our public process**
- **Future steps include**
  - Public meetings starting on July 15 to share information with and get comments from the public on the Project as part of the PNZ process
  - Public meetings with the PNZ Commission and BOS
  - Public meetings for ACC approval process
  - Public meetings for the Federal approval process

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Agenda

11:00	Welcome and Introductions
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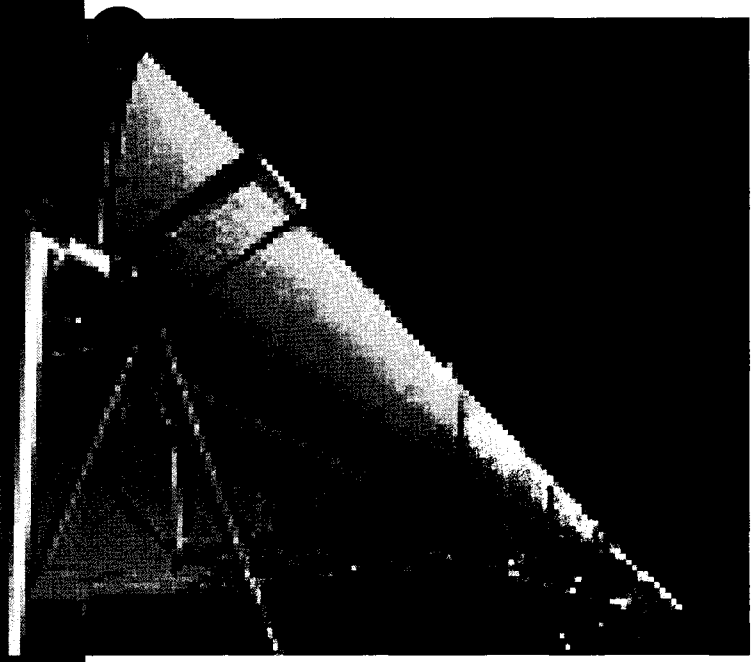

Project Overview

- Who are we?
- How did we get here?
- Where are we going?

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Who Are We?

- **Mohave Sun Power LLC**
  - Development company
  - Mission: develop, construct, own and operate utility-scale solar power projects
  - Principals have previously developed energy and renewable energy projects
  - Mitchell Dong, Executive Director
  - Greg Bartlett, Managing Director
  - Hualapai Valley Solar LLC (HVS), a wholly owned subsidiary, is a single-purpose project company

[redacted]

Project Team

- **Greg Bartlett, Project Director**
- **Mike LaRow, Environmental Director**
- **Chris Stephens, Advisor**
- **Fichtner Solar GmbH**
  - Engineers for 75% of all CSP plants in the world
  - More than 20 current projects worldwide
- **Tierra Environmental Consultants**
  - Consultants for Arizona Solar 1 project in Arizona
  - Larry Killman and Kenda Pollio

[redacted]

How Did We Get Here?

- **Site search & analysis (6-9 months)**
  - Mohave County site
  - Maricopa County sites
  - Southern Nevada sites
- **Baseline analyses**
  - Environmental, cultural resources, water management, sunlight, slope, geology, power plant modeling, etc.
- **Mohave County is our #1 choice**

[redacted]

The Site At Red Lake

- **Private land**
- **Sunlight (DNI)**
- **Remote area**
- **Flat land, stable geology**
- **Water availability and quality**
- **Proximity to transmission line (3 paths)**
- *These traits, **when considered together**, make the site one of the best in the world*

[redacted]

The Next 18 Months

- **Permitting & public process**
- **Engineering, Procurement & Construction (EPC) contract**
- **Power Purchase Agreement (PPA)**
  - Company goals: sell to Mohave County, sell to Arizona, and then elsewhere
  - May be more than one PPA
- **Project financing**
- **Construction begins at the end of 2010**

[redacted]

The Power Plant

- **4,000 "Collectors" (troughs)**
  - Each collector is ~500 x 20ft
  - 30 million ft^2 of solar field (mirrors)
  - 50 ft between collectors
  - Land area of collectors ~3,000 acres
- **340 MW turbine**
- **Up to 8 hours of energy storage**
- *Power plant begins operation late 2013*

[redacted]

Why Is The Project Necessary?

- Additional electricity must be generated to meet demand, expected to increase by 26% by 2030
- Several states have identified Renewable Energy Standards (RES)
  - **AZ 15% by '25 / CA 33% by '20 / NV 20% by '15**
- Obama goal of doubling renewable energy in the next 3 years (Feb 24 '09 State of the Union)
  - >$100 billion on foreign oil and >$25 billion to Persian Gulf states per year
- Renewable energy results in significantly lower greenhouse gas emissions and a smaller carbon footprint than fossil fuel power plants

Project Benefits (Local)

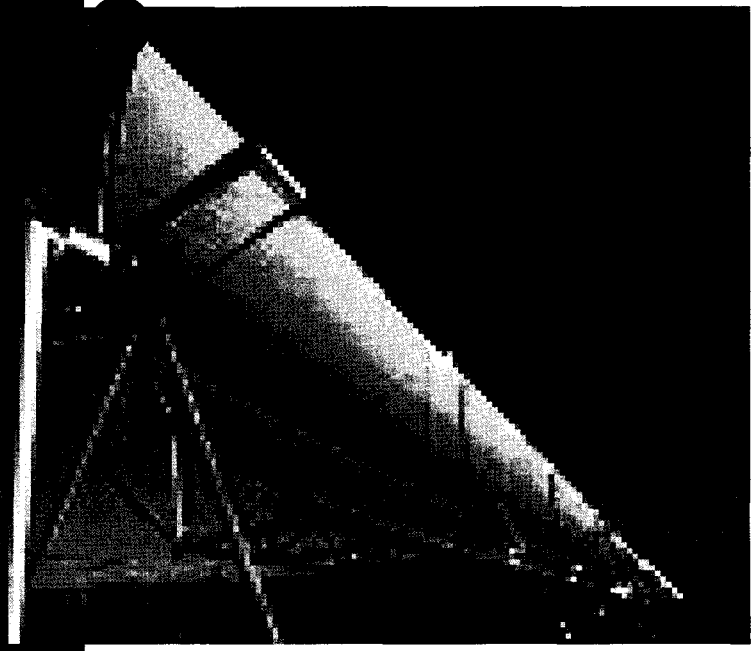
- 1,500 jobs for 3 yrs (construction) / 100+ for 25+ yrs (operation)
  - Also adds secondary and tertiary jobs
  - Add to that wages put back into the local economy for housing, food, transportation, entertainment, taxes, etc.
  - Operational period expenditures on operations and maintenance create more permanent jobs than alternative natural gas fueled generation (NREL report)
- Local goods and materials purchased for the Project
- Local service contracts (engineering, security, etc.) for the Project,
- LOCAL TAX REVENUE: property tax, employment revenue, sales tax
  - Mohave County economic impact model analysis underway
- Flagship large-scale project will be the foundation used to make Mohave County the renewable energy capital of Arizona and the US
- Each dollar spent on CSP contributes approximately $1.40 - $1.50 to Arizona's Gross State Product (NREL report)

[redacted]

Project Benefits (US/Global)

- Reduced emissions vs. natural gas plant:
  - 25.5 tons of NO_x per year
- CSP plants are a fixed-cost generation resource
  - Offers consumers a hedge against the fluctuating cost of electricity produced with natural gas, coal, oil
  - Helps eliminate our dependence on foreign oil

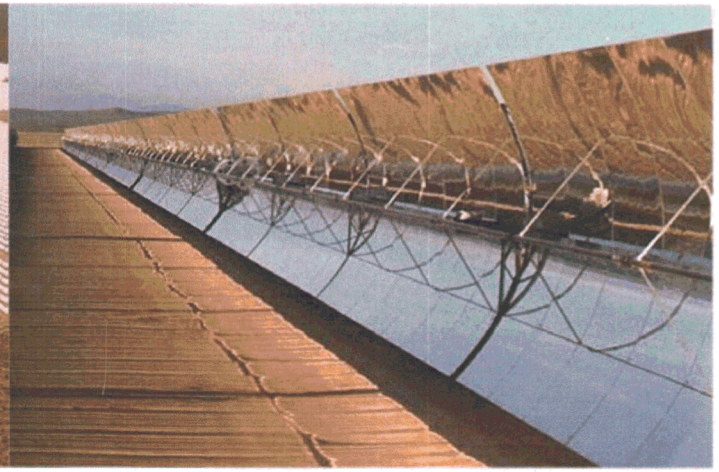
[redacted]



Solar Technology

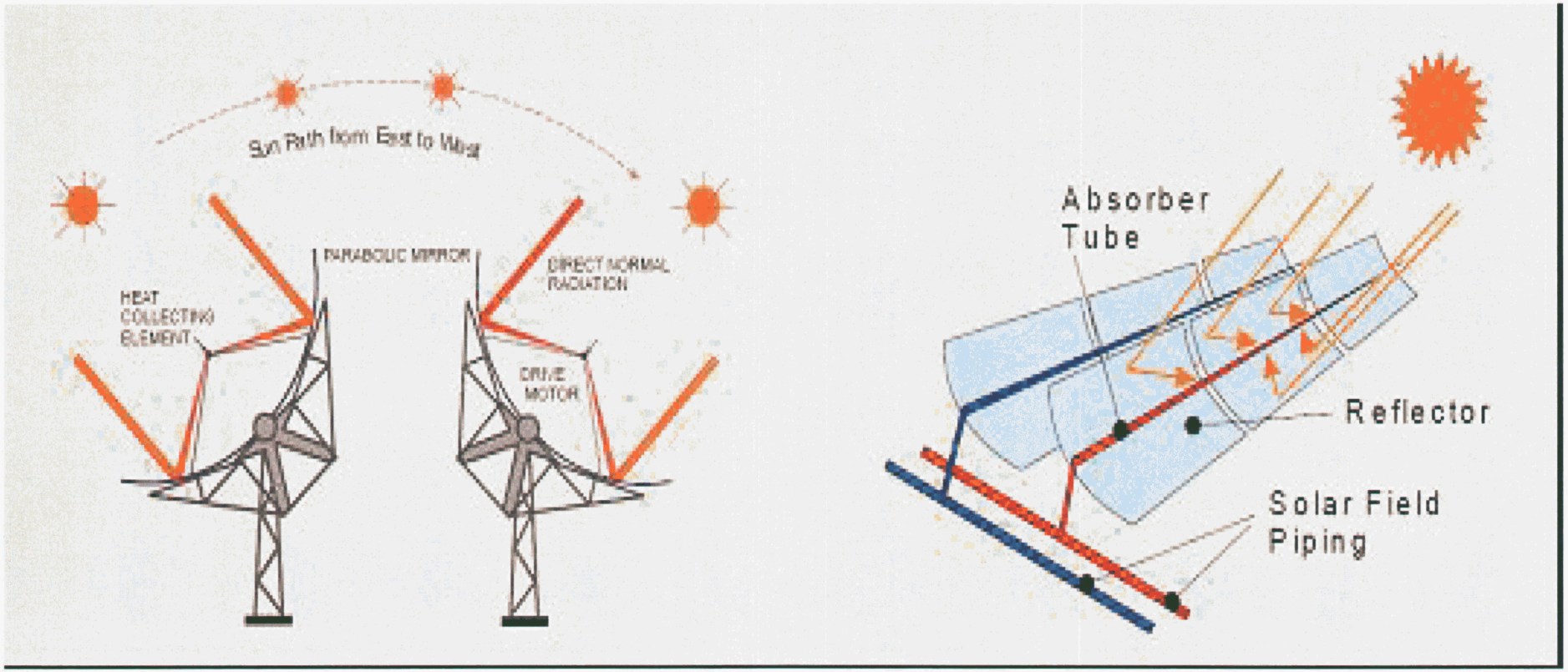
hualapai valley solar™
a mohave sun power project

Solar Power Technologies

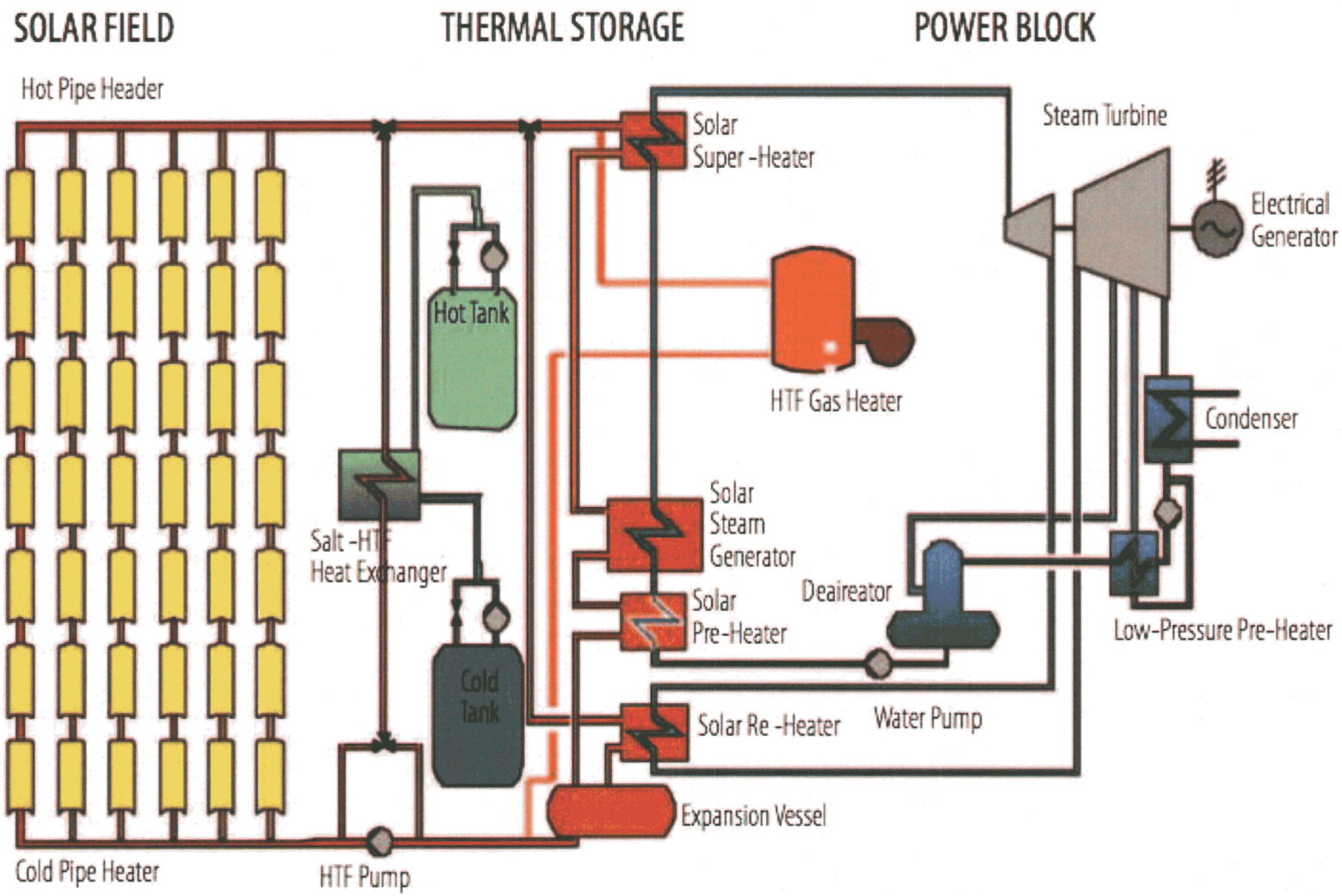


- HVS has selected solar trough technology supplemented by thermal storage provided by molten salts
- Solar trough is proven on utility scale (1984 SEGS through current projects in Spain)
- Thermal storage provides flexibility to generate when the users need electricity - not just when the sun shines or wind blows

Solar Power Technologies



Solar Power Technologies



Home

Site Details and Environmental Aspects

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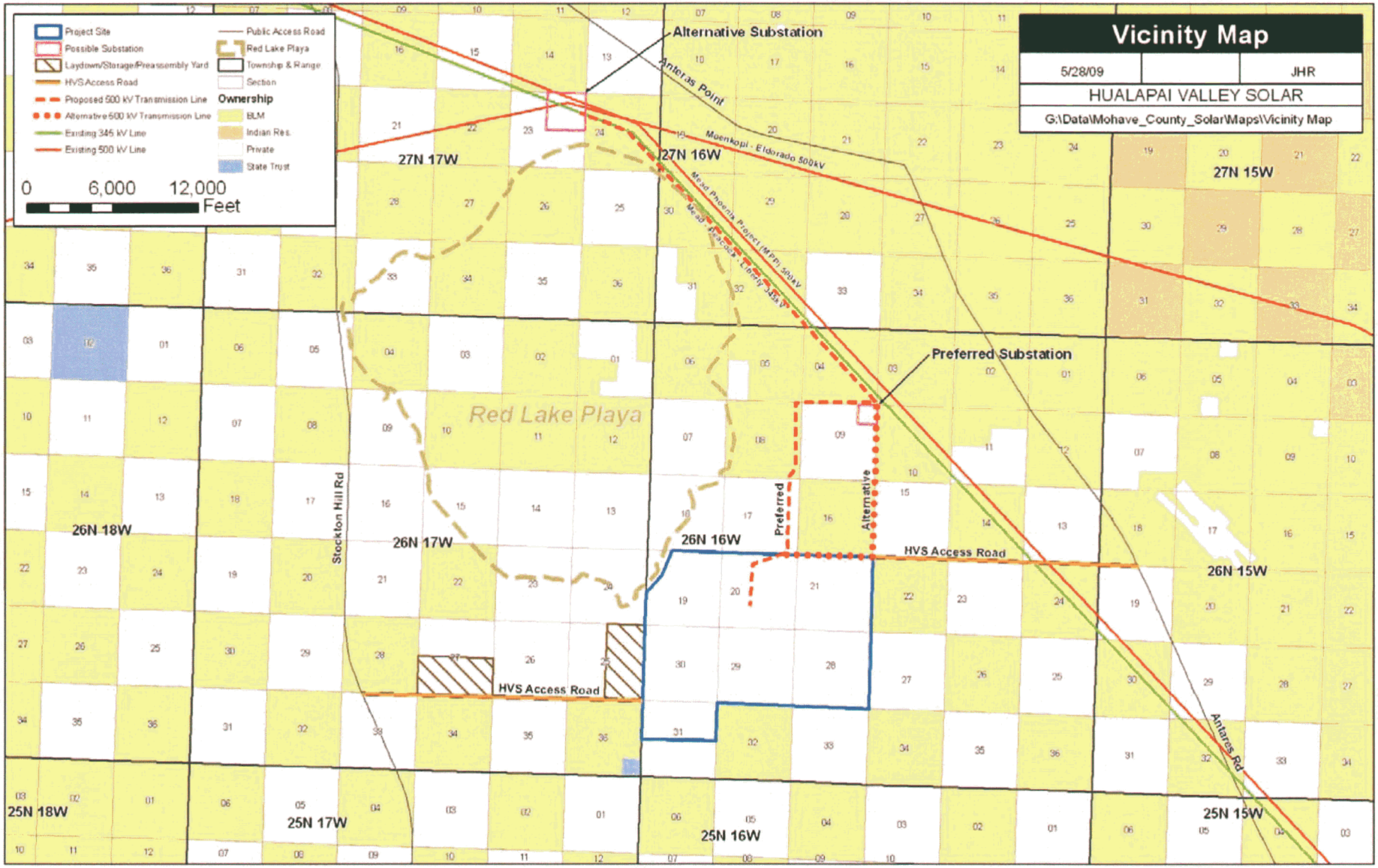
Project Site



Home

Environmental Aspects

- Baseline studies are ongoing and **no fatal flaws** have been identified for:
  - Air Quality
  - Biology
  - Cultural
  - Geology and Soils
  - Land Use
  - Health, Safety, and Noise
  - Recreation
  - Socioeconomics
  - Visual Resources

[redacted]

Permits and Authorizations

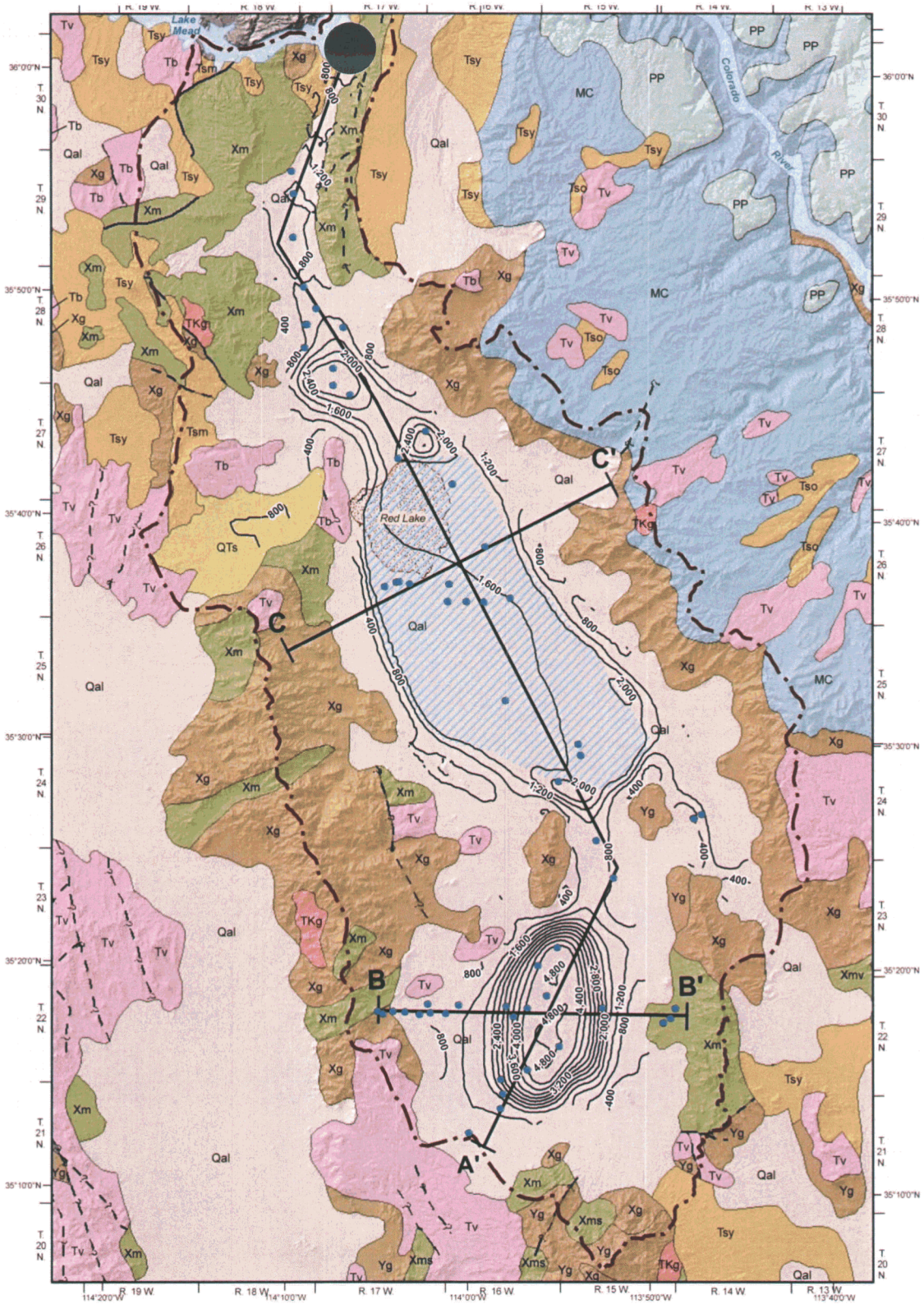
- Amendment to the General Plan for Mohave County – applied on March 6, 2009
- EIS under NEPA
- CEC from ACC
- APP from the ADEQ
- Air Permit from ADEQ

[redacted]

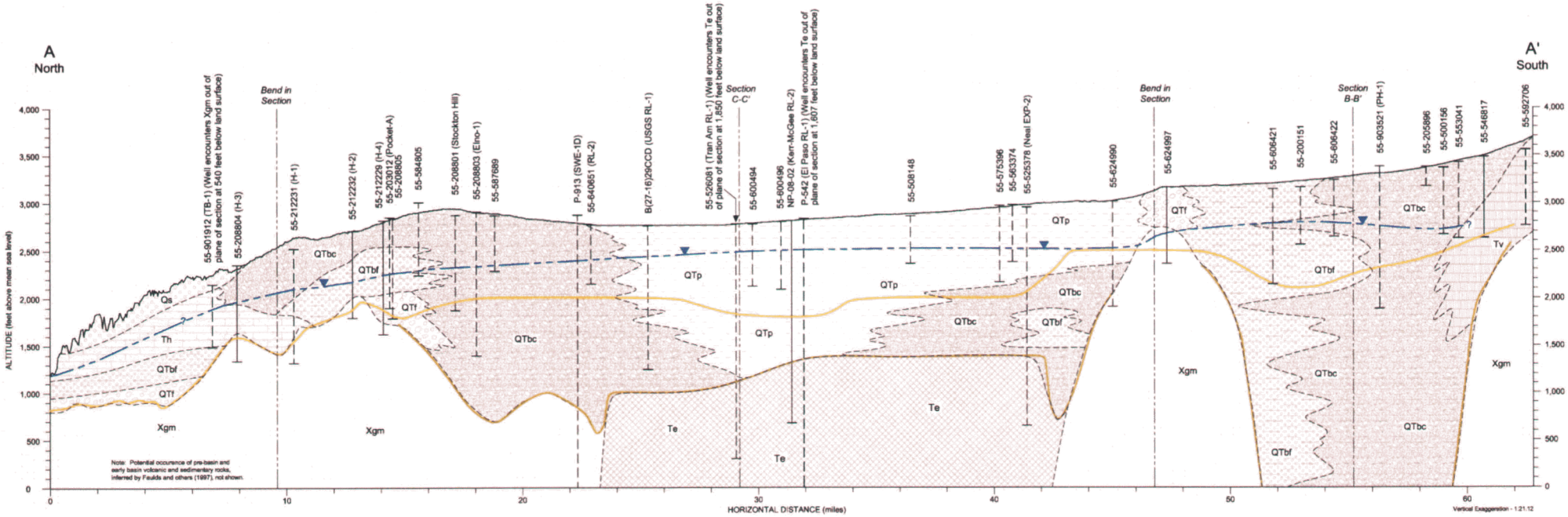
HVS Water Supply

- Conservative est. raw water demand:
  = **3,000 AF/yr** average
  = **1,860 gpm** continuously
- Preliminary plan includes 3 wells plus 1 backup
- Projected life of solar plant = 30 yrs
- Total groundwater use = **90,000 AF / 30 yrs**
- Groundwater storage in basin
  - Storage above depth of 1,200 feet = **15.8 million AF**
  - Storage above bedrock (incl. salt) = **37 million AF**

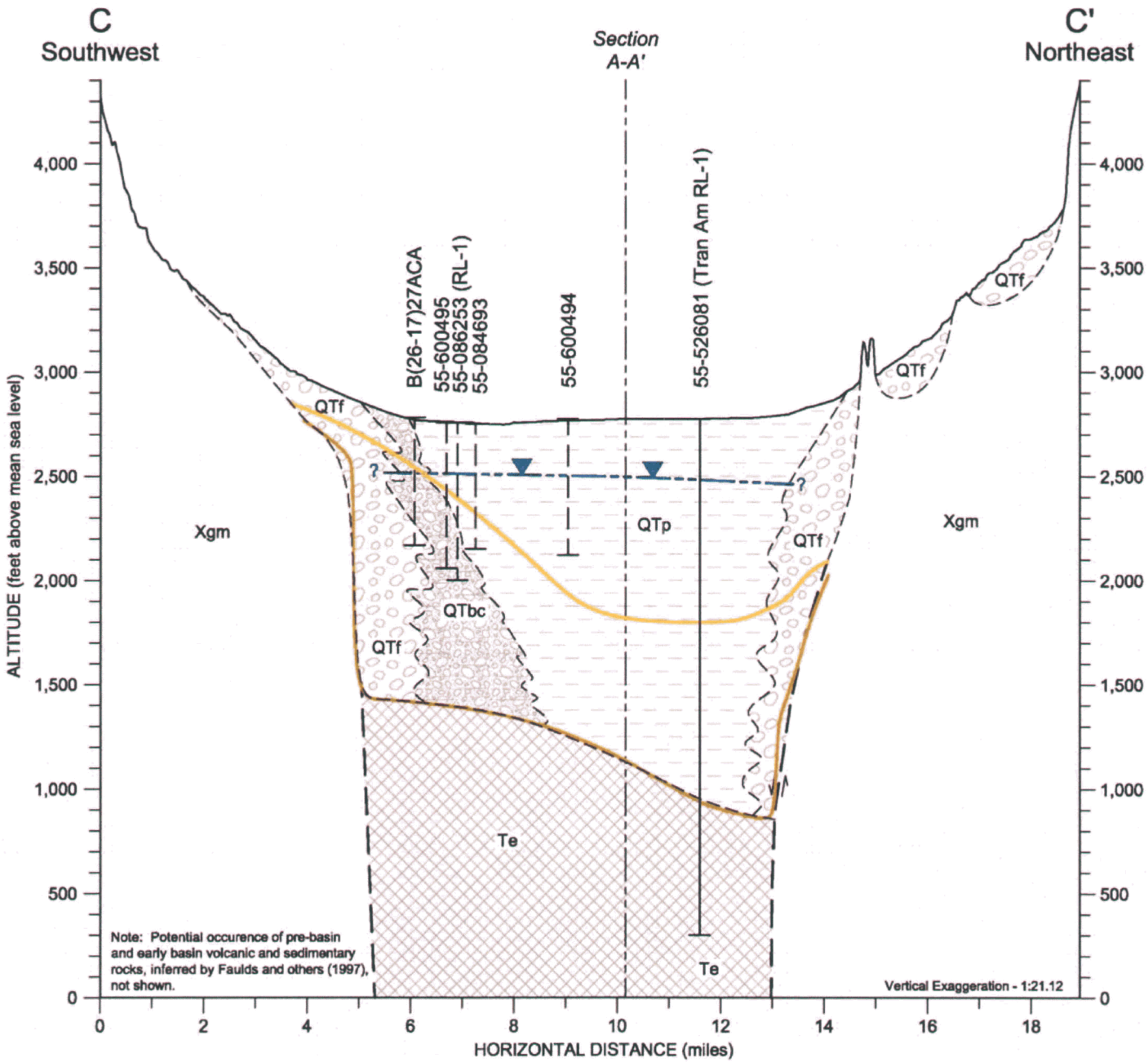
GEOLOGIC MAP



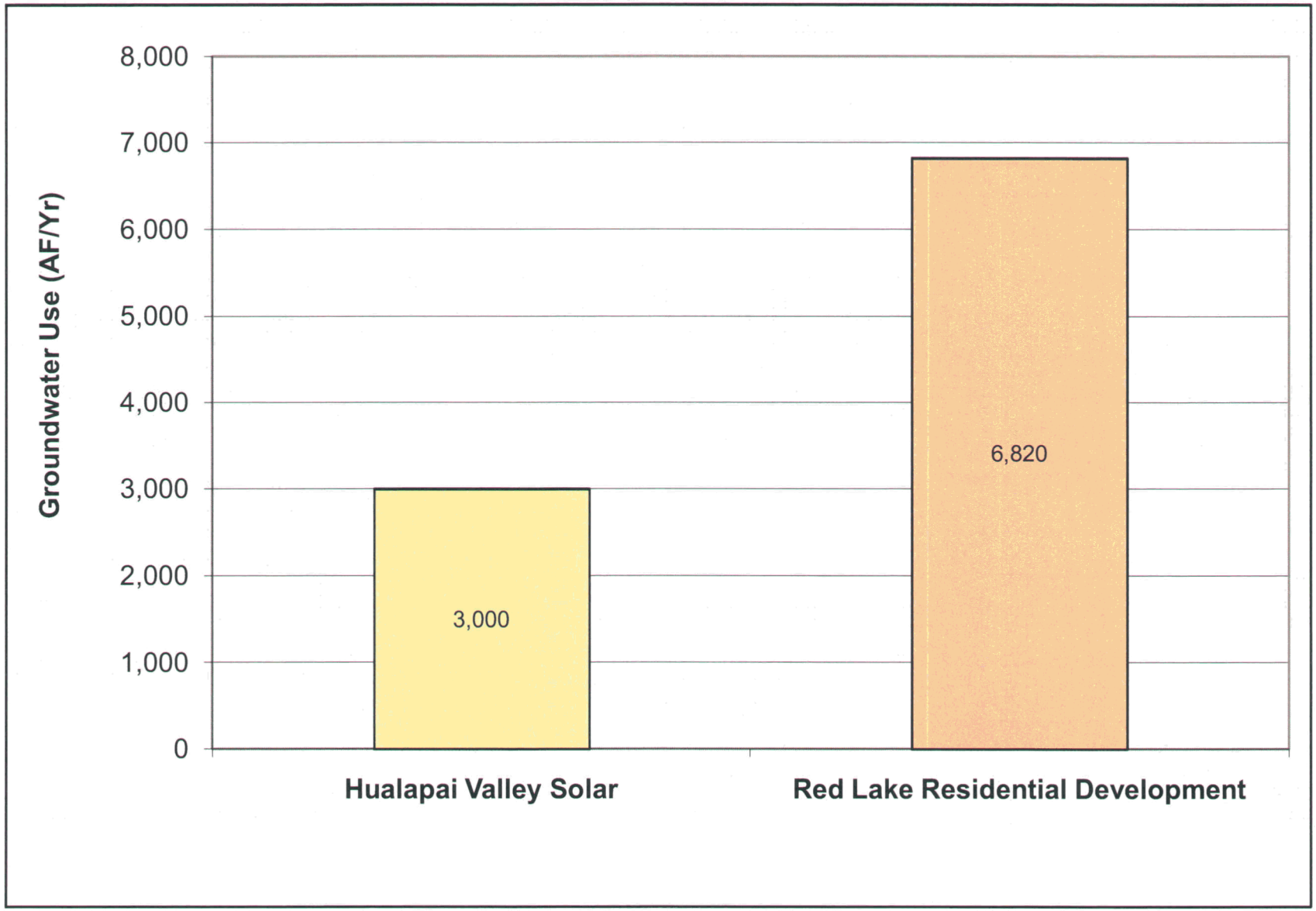
HYDROGEOLOGIC SECTION A-A'



HYDROGEOLOGIC SECTION C-C'



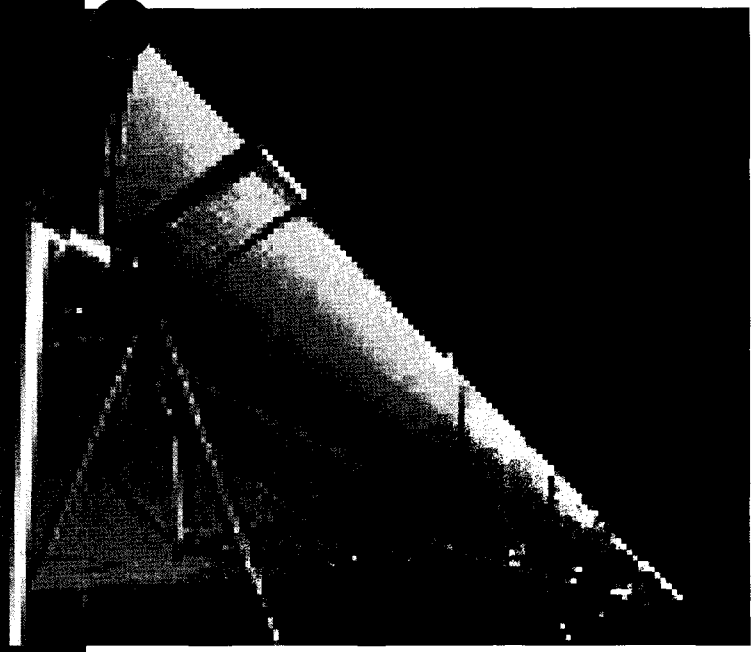
COMPARATIVE GROUNDWATER USE



Groundwater Summary

- 6.5 square miles at SE margin of Red Lake
- HVS will estimate projected impacts of proposed groundwater withdrawal using a sophisticated, calibrated, ADWR-accepted numerical groundwater flow model developed by Montgomery & Associates for the Hualapai basin
- Land is currently part of a residential development that holds an ADWR determination of "Adequate Water Supply" permitting a total withdrawal of about 46,000 AF/yr
- HVS will model groundwater level drawdown due to HVS pumping in the basin over the life of the project assuming current and committed demands to determine likely impacts on aquifer water quantities and levels

[redacted]



Process and Schedule

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Process

- **This is only the first step in our public process**
- **Future steps include**
  - At least 3 public meetings starting on July 15 to share information with and get comments from the public on the Project as part of the PNZ process
  - Public meetings with the PNZ Commission and BOS
  - Public meetings for ACC approval process
  - Public meeting for air permit
  - Public meetings for the Federal approval process

[redacted]

Schedule

- Jan-Jun09 - Preliminary Engineering/Design
- Mar09 - Area Plan & General Plan Amendment Applications with County
- Jun-Sep09 - Area Plan & General Plan Public Meetings
- Sept09 - Area Plan & General Plan Hearing with the Planning & Zoning Commission
- Dec09 - Board of Supervisors Area Plan & General Plan Hearing
- Jun09-Aug10 - State & Federal Permitting
- Jul09-Nov10 - Final Engineering/Design
- Nov-Dec10 - Start Construction
- Jun13 - Commercial Operation

Open Houses

Date: July 15
5:00 – 7:00 p.m.
Valle Vista Country Club
9686 N Concho Drive

Date: July 16
5:00 – 7:00 p.m.
Kingman H.S.
4182 Bank St.

Others to be scheduled.

QUESTIONS:

1-877 487-1437

info@HualapaiValleySolar.com

www.hualapaivalleysolar.com

hualapai valley solar™
a mohave sun power project

Hualapai Valley Solar

Initials	Name	Agency/ Company
•	Barbara Rezac	
•	Joan Cates-Jacks	
•	Curtis Ridge	
•	Anthony Martinez	ADOT
•	Judi Scaliatine	93 AGS
•	Billie O'Dell	93 AGS
	MIKE BIHUNIAK	
	CLARICE DAVIS	93 AGS
	Jim Smith	93 AGS
	PATRICK MOORE	NACFD
	JACK KRAMER	City of Kingman
	Mike Roberts	Uni Source
	JACK HOMMEL	N.W. AZ WATERSHED COUNCIL
	JACK Ehrhardt	Hualapai Tribe
	Craig J. Johnson	BLM
	PATTI LEWIS	

* Indicates primary phone number

Project CAC Meeting

Phone	Email Address	Keep me informed of the project
928-692-9912	GGMA_BR@YAHOO.COM	
928 681-4269	Vordeduo@frontiernet.net	
928-757-4047	lsruge@rraz.NET	
928-681-6019	amartinez@azdot.gov	
909-717-3589	freedomranch@getsky.com	
928-279-5941	Billie O'Dell@yahoo.com	
928 692-1840	Clarke125@live.com	
928 530 3491		
928.754.3151		
928-753-8100	JKramer@cityofkingman.gov	
928-681-6575	mroberts@uesaz.com	
928-565-5756	THEVIEW@GOLDENVALLEYCABLE.COM	
7692216	Hualapaiplanning@CTLink.net	Sure
718-3731	Craig_J_Johnson@blm.gov	
928-757-4972	patti@lewis.name	yes

June 30, 2009
Page 1 of 5

Hualapai Valley Solar

Initials	Name	Agency/ Company
2 ppl WE & SL	WAYNE E SANDRA L Smith	
	John Gall	Arizona Land Questu
	JANA SELK	
	MICHAEL FLYNN	
	John Salem	City of Kingman
	Debra Sola	Mohave Utility
	STEVE WAGNER	Mohave Utility
	Ryan Smith	Kingman Chamber
	Dave Hawkins	news media
	Rebecca Peck	Bureau of Land Mgmt
	DON McClure	Bureau of Land Mgmt
	Kay MACKLIN	
	June Pelehowski	UES Electric
	Resal Graven	"
	Frey Van S.	Turn-2-Solar LLC.

* Indicates primary phone number

Project CAC Meeting

Phone	Email Address	Keep me informed of the project
928-273-1031		
928 412 4157	92landquest@gmail.com	
928-757-9747		
753-8101		
7188800D	debrasiotte@citlink.NET	
718-8100	SWRONTYAR@Yahoo.C	
753-6253	ryan@kingmanchamber.org	
715-9245	newshawk22@hotmail.com	
718373 2	Rebecca_Peck@blm.gov	✓
718-3725	don_mcclure@blm.gov	yes
897-6067	kay.mackin@frontiernet.net	yes
928681 8938	jpelehowski@vesaz.com	
928-681-8921	ronwen@mesaz.com	
(928)266-3705	dfsolar@Live.Com	✓

June 30, 2009

Hualapai Valley Solar P

Initials	Name	Agency/ Company
JS	Janice Stroud	AZ Game + Fish
	Judy Porter	
	Todd Rhoades	Western Area Power Admin
	Denise Bunsman	1451 Wilks (FAX 692-699
	JON MONGIAT	—
	DEAN STOSBERG	—
2 pp	Debra / Butch Martin	
	Loretta Kelly	Hualapai Tribe - T.H.P.O.
	[illegible]	Mohave Co

* Indicates primary phone number

·oject CAC Meeting

Phone	Email Address	Keep me informed of the project
928-692-7700 Ext 2350	jstroud@azgfd.gov	yes.
602-605-2613		
692-6933 (928) 727-6933	denise.bensuson@hughes.net	yes + requesting a copy of these lists!
928-302-8735	JON MONGHAT@yahoo.com	
928-565-0335	—	
928 681 6898	andi@butchwestin.com	yes
928 769-2223	lorjacc@frontiernet.net	yes
928 757-0902	christine.haliard@co.mohave.az.us	yes

June 30, 2009

Hualapai Valley Solar P

Initials	Name	Agency/ Company
	Wayne Wissinger	Eagle Realty
	Suzanne Adams	Kingman Daily Miner
	Mitch Smith	Taxpayer - Mohave County
	Andy Whitefield	BLM
	Chris Durkin	Rt 66 ASSN KINGMAN DOWNTOWN MERCHANTS
	Lou Cardenas	6499 E El Paso Dr Kingman AZ LOUISATELPASO@YAHOO.COM

* Indicates primary phone number

›ject CAC Meeting

ıone	Email Address	Keep me informed of the project
5300340	Wayne@eram.us	
53-6397	sadams@kdminc.com	yes
768-7539	testdude86@hotmail.com	Yes
718-3746	andy_whitefield@blm.gov	
728 830 3755	CDURKIN@HOTMAIL.COM	YES!
9285301504	LOUISATELFNSO@YAHOO.COM	YES

June 30, 2009

Hualapai Valley Solar P

Initials	Name	Agency/ Company
	Dennis Macklin	
	DEAN WOLSINGER	LOWER COLORADO RC&D NRCS
	Leo HORVER	SRC
	Susan Jordan	Windmill Ranch
	VAL STARR	LDIC
	Bob Riley	Kingman Airport Authority
	Jim Kanelos	SVS.

* Indicates primary phone number

ɔject CAC Meeting

ıone	Email Address	Keep me informed of the project
925-897-6067	kay.mackling@gmail.com	Yes
714 305 1252	DEANW1@AOL.com	YES
28-530-1363		yes
28-692-7915	Rockin22@frontiernet.net	yes
928 565-7132	SUSINC@LIVE.COM	YES
28 757-2134	KAAECONDEV@CITLINK.NET	Yes
565-2453	SVSINC@live.com	Yes

June 30, 2009
Page 5 of 5

Hualapai Valley Solar Project
June 30, 2009
Comment Form

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

P.MOORE@NORTHERNAZFIRE.COM
E-mail address

PATRICK MOORE
Name

NORTHERN ARIZONA CONSOLIDATED FIRE
Organization

2470 Butler AVE.
Street Address

928 757-3151
Daytime Phone No. (*optional*)

KINGMAN
City

AZ
State

86401
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

WHAT ARE YOUR FIRE PROTECTION PLANS & CODE ENFORCEMENT IDEAS? (EMERGENCY SERVICES ETC.)

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
June 30, 2009
Comment Form

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☒ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

CLARICEdus125@Gmail.Com
E-mail address

CLARICE DAVIS
Name

93 AG South
Organization

3075 N. OWEN WEST
Street Address

928 692-1840
Daytime Phone No. *(optional)*

KINGMAN AZ 86401
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

WATER / SALT / OIL
WATER IS THE BIG PROBLEM
WHAT SALTS ARE BEING USED / WHERE FROM / HOW MUCH —
WHAT OIL IS BEING USED — WHAT KIND / HOW MUCH

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

I STRONGLY SUGGEST YOU GO DRY
PHOTOVOLTAIC SO YOU ARE NOT USING
OUR NATURAL RESOURCES

Thank you for your time and interest in the Hualapai Valley Solar Project.

I HAVE LIVED ON SOLAR/WIND FOR 20 YEARS.
IT IS DIFFERENT. BUT CERTAINLY FEASABLE
& NO WATER

Appendix B:

Open House Materials

hualapai valley solar™

a mohave sun power project

Open House Meetings

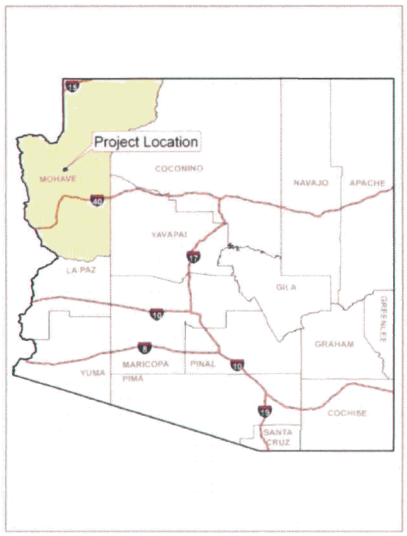
Hualapai Valley Solar LLC is conducting its first two Open House Meetings in mid July to present the Hualapai Valley Solar Project (HVS Project) and discuss project issues. The HVS Project is a 340 MW solar electric generating plant that will be located approximately 27 miles north of Kingman near Red Lake. The HVS Project will use concentrating solar power (CSP) technology coupled with the ability to store energy during non-sunlight hours, to better meet renewable energy standards.

Representatives of the project will be available to answer questions and provide information. We welcome your input and hope you can join us at an Open House meeting. The same information and representatives will be available at both meetings. It is an Open House format and you can come anytime. An RSVP is **not** necessary. If you have questions please call 1-877-487-1437 or visit our website at *www.hualapaivalleysolar.com.*

Date: **July 15**
5:00 – 7:00 p.m.
Valle Vista Country Club
9686 N Concho Drive
Kingman, AZ 86401

Date: **July 16**
5:00 – 7:00 p.m.
Kingman High School
4182 Bank St.
Kingman, Arizona 86409

Open House Meetings



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Date: **July 16**
5:00 – 7:00 p.m.
Kingman High School
4182 Bank St.
Kingman, Arizona 86409

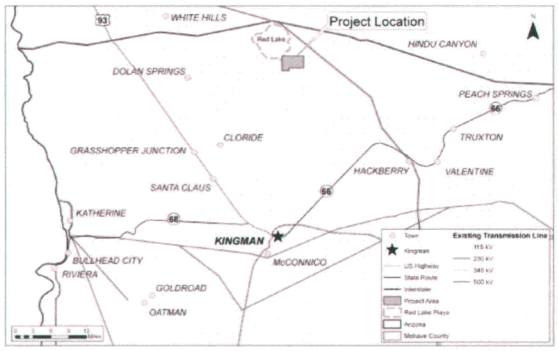
hualapai valley solar™
a mohave sun power project

2701 E Andy Devine Avenue - Suite 300
Kingman, AZ 86401

Resident Address

PLEASE ATTEND AN OPEN HOUSE

Open House Meetings



Hualapai Valley Solar LLC is conducting a third Open House Meeting to present the Hualapai Valley Solar Project (HVS Project) and discuss project issues. The HVS Project is a 340 MW solar electric generating plant that will be located approximately 27 miles north of Kingman near Red Lake. The HVS Project will use concentrating solar power (CSP) technology coupled with the ability to store energy during non-sunlight hours, to better meet renewable energy standards.

Representatives of the project will be available to answer questions and provide information. We welcome your input and hope you can join us at an Open House meeting. It is an Open House format and you can come anytime. An RSVP is **not** necessary. If you have questions please call 1-877-487-1437 or visit our website at *www.hualapaivalleysolar.com.*

Date: **August 6, 2009**
5:00 – 7:00 p.m.
Community Center
15195 North Pierce Ferry Road
Dolan Springs, AZ 86441

hualapai valley solar™
a mohave sun power project

2701 E Andy Devine Avenue - Suite 300
Kingman, AZ 86401

Resident Address

PLEASE ATTEND AN OPEN HOUSE

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)753-6222.

OPEN HOUSE MEETING

hualapai valley solar™

a mohave sun power project

Hualapai Valley Solar LLC is conducting a third Open House Meeting to present the Hualapai Valley Solar Project (HVS Project) and discuss project issues. The HVS Project is a 340 MW solar electric generating plant that will be located approximately 27 miles north of Kingman near Red Lake. The HVS Project will use concentrating solar power (CSP) technology coupled with the ability to store energy during non-sunlight hours, to better meet renewable energy standards.

Representatives of the project will be available to answer questions and provide information. We welcome your input and hope you can join us at this Open House meeting. The same information and representatives will be available as the first two meetings. It is an Open House format and you can come anytime. An RSVP is not necessary.

AUGUST 6, 5:00 PM THROUGH 7:00 PM
COMMUNITY CENTER, 15195 N. PIERCE FERRY ROAD
DOLAN SPRINGS, ARIZONA 86441

HYUNDAI
CASH
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GET UP TO
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WITH 1984 AND NEWER TRADE-IN.
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Drilling a Well?

DON'T THROW YOUR MONEY DOWN A DRY HOLE!

LET SCIENCE HELP

Test for water *before* drilling!

Water for Wells uses the same technology as the oil & gas industry

WE'LL FIND LOCATION, APPROXIMATE DEPTH & YIELD

1-877-346-WELL

OPEN HOUSE MEETINGS

hualapai valley solar™

a mohave sun power project

Hualapai Valley Solar LLC is conducting two Open House Meetings to present the Hualapai Valley Solar Project (HVS Project) and discuss project issues. The HVS Project is a 340 MW solar electric generating plant that will be located approximately 27 miles north of Kingman near Red Lake. The HVS Project will use concentrating solar power (CSP) technology coupled with the ability to store energy during non-sunlight hours, to better meet renewable energy standards.

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July 15, 5PM-7PM
Valle Vista Country Club
9686 N. Concho Drive
Kingman, AZ 86401

July 16, 5PM-7PM
Kingman High School
4182 Bank Street
Kingman, AZ 86409

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Buy It Toda

Jenner

807 E. A

Mc

1595 Joy Lan

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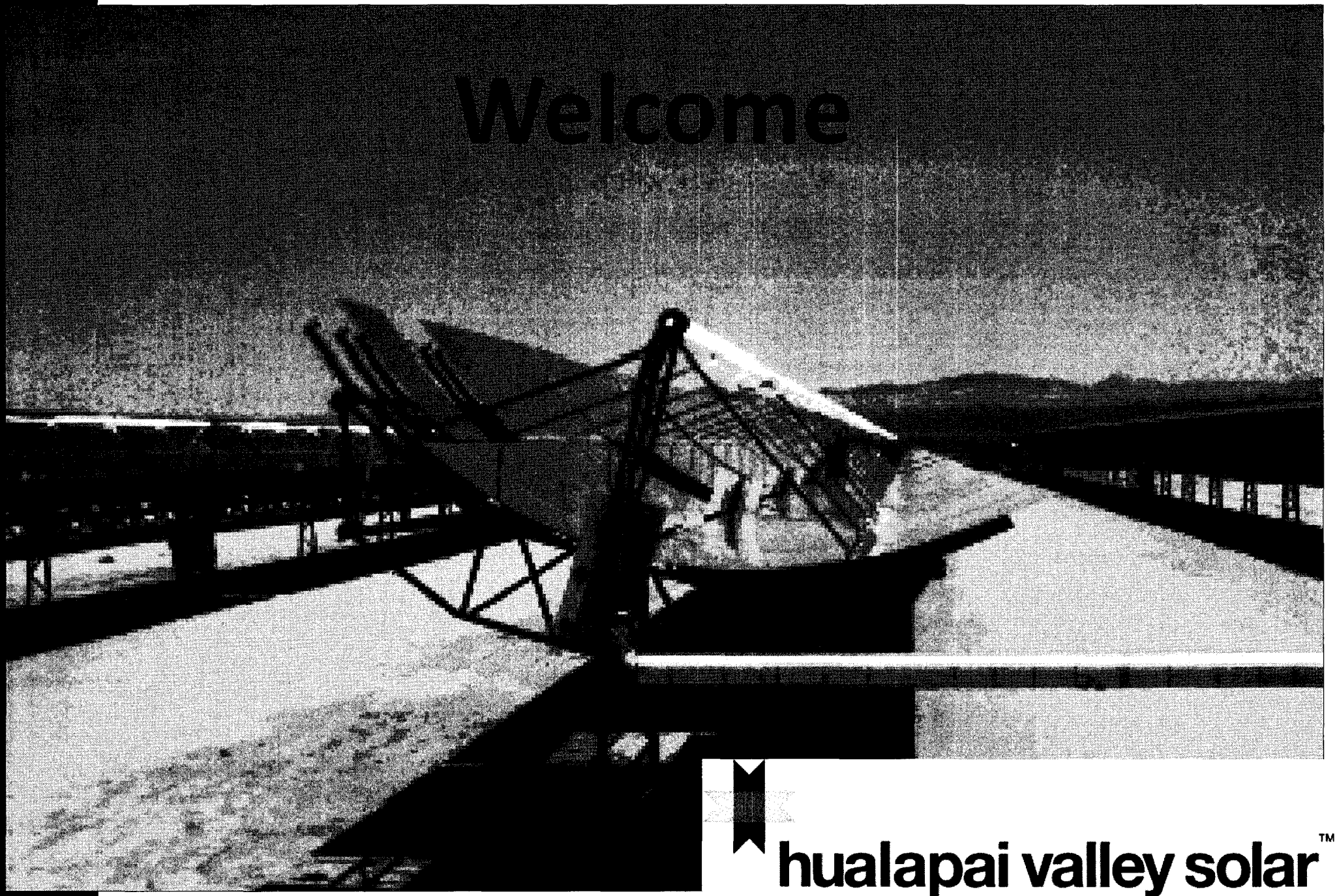

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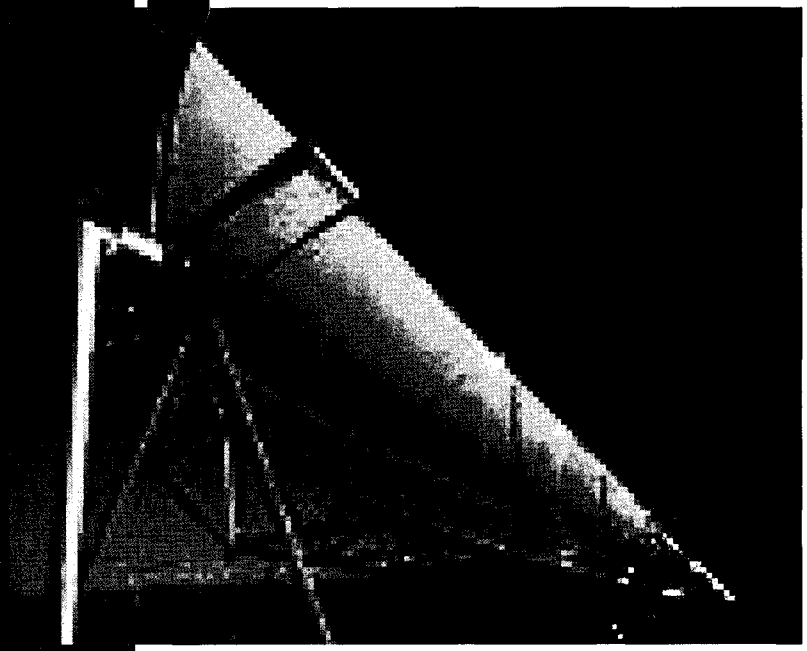
a mohave sun power project



Project Overview

hualapai valley solar™
a mohave sun power project

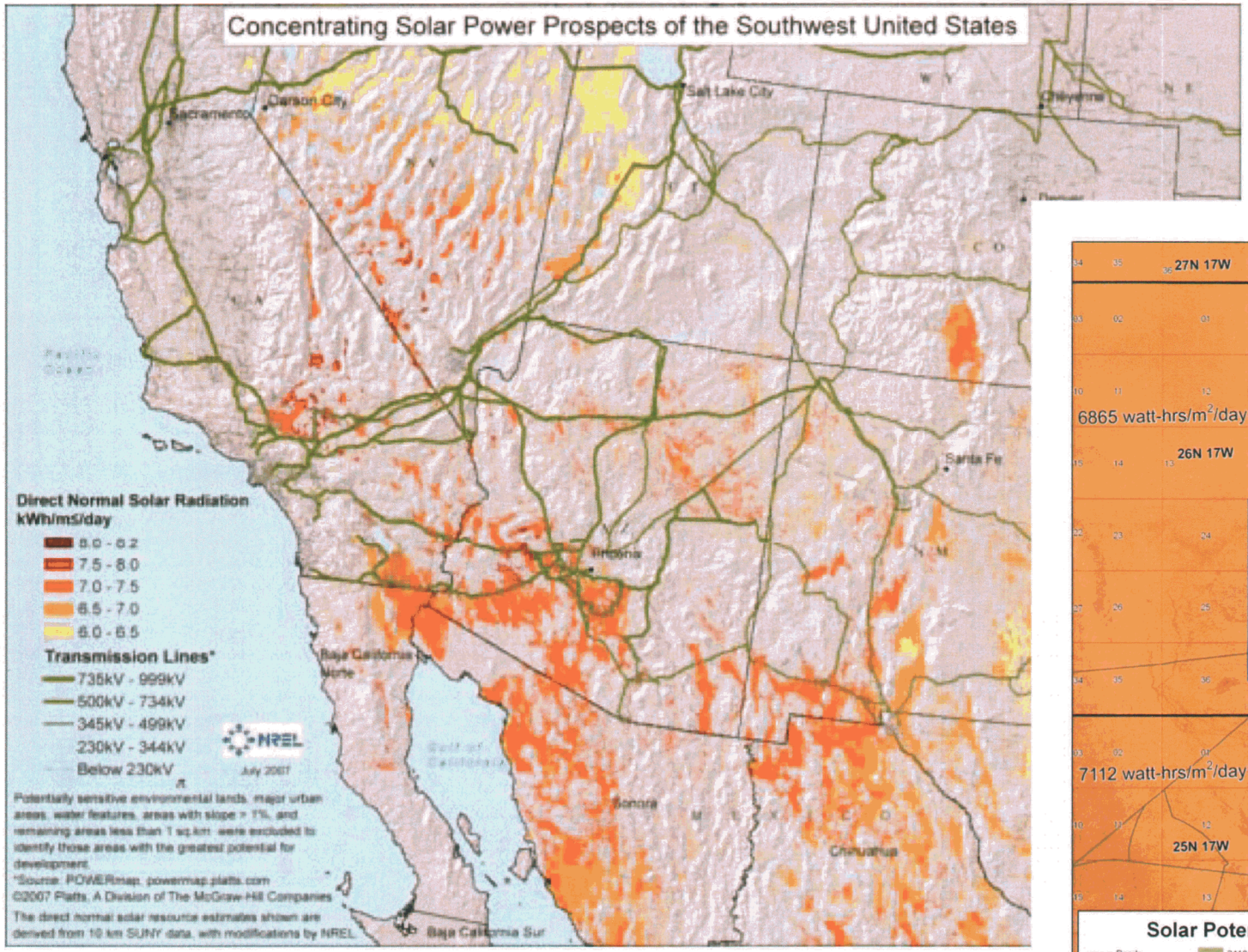
Mohave Sun Power LLC

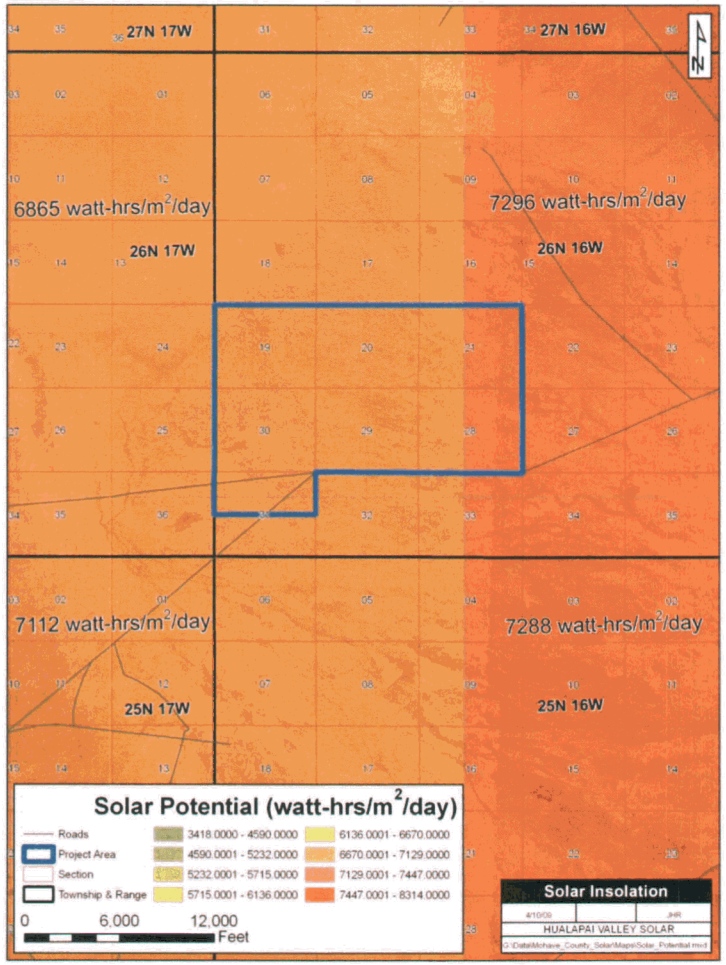
- A development company
- Mission: to develop, construct, own and operate utility-scale solar power projects
- Principals have previously developed energy and renewable energy projects
- Mitchell Dong, Executive Director
- Greg Bartlett, Managing Director
- Robin Lafoley, Managing Director
- Hualapai Valley Solar LLC, a wholly owned subsidiary, is a single-purpose company

Hualapai Valley Solar Project Team

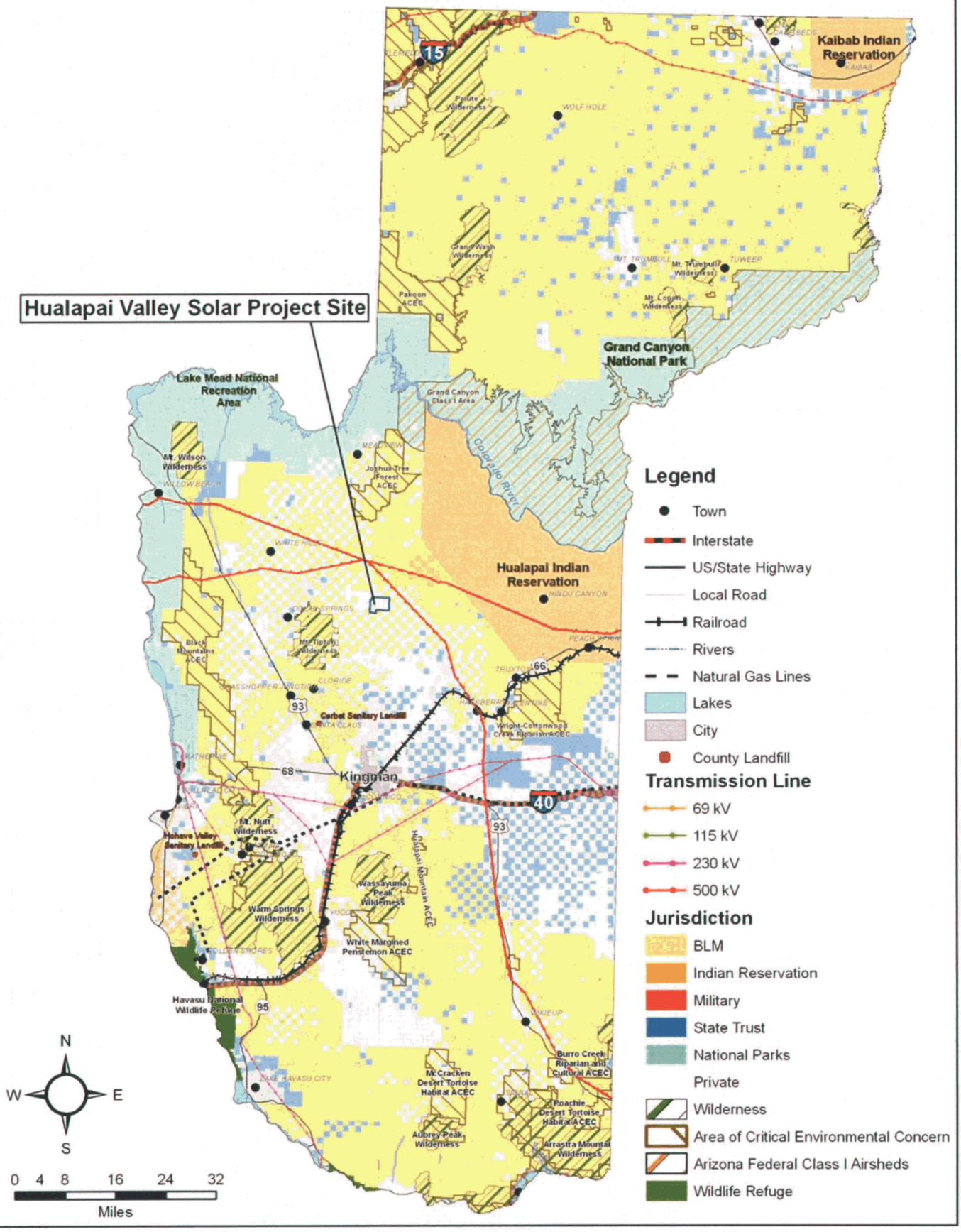
- **Greg Bartlett, Project Director**
- **Mike LaRow, Environmental Director**
- **Fichtner Solar GmbH**
  - Engineers for 75% of all CSP plants in the world
  - More than 20 current projects worldwide
- **Tierra Environmental Consultants**
  - Consultants for Arizona Solar 1 project in Arizona
  - Larry Killman and Kenda Pollio
- **Chris Stephens, Advisor**

Why Arizona?


Concentrating Solar Power Prospects of the Southwest United States
Sacramento
Carson City
Salt Lake City
Cheyenne
Santa Fe
Phoenix
Baja California Norte
Sonora
Chihuahua
Baja California Sur
Direct Normal Solar Radiation
kWh/m2/day
8.0 - 8.2
7.5 - 8.0
7.0 - 7.5
6.5 - 7.0
6.0 - 6.5
Transmission Lines*
735kV - 999kV
500kV - 734kV
345kV - 499kV
230kV - 344kV
Below 230kV
NREL
July 2007
Potentially sensitive environmental lands, major urban areas, water features, areas with slope > 1%, and remaining areas less than 1 sq.km were excluded to identify those areas with the greatest potential for development.
*Source: POWERmap, powermap.platts.com
©2007 Platts, A Division of The McGraw-Hill Companies
The direct normal solar resource estimates shown are derived from 10 km SUNY data, with modifications by NREL.


27N 17W
27N 16W
6865 watt-hrs/m2/day
7296 watt-hrs/m2/day
26N 17W
26N 16W
7112 watt-hrs/m2/day
7288 watt-hrs/m2/day
25N 17W
25N 16W
Solar Potential (watt-hrs/m2/day)
Roads
Project Area
Section
Township & Range
3418.0000 - 4590.0000
4590.0001 - 5232.0000
5232.0001 - 5715.0000
5715.0001 - 6136.0000
6136.0001 - 6670.0000
6670.0001 - 7129.0000
7129.0001 - 7447.0000
7447.0001 - 8314.0000
0
6,000
12,000
Feet
Solar Insolation
HUALAPAI VALLEY SOLAR

Mohave County Overview

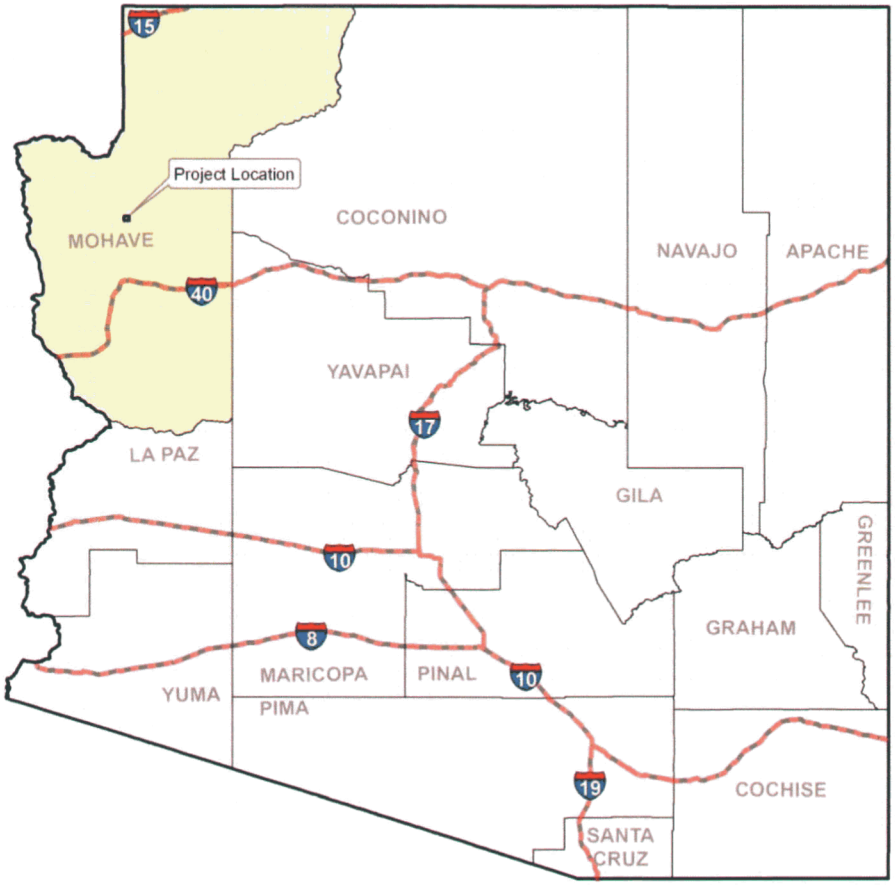


The HVS Site At Red Lake

- **Private land**
- **300+ days of excellent sunlight (DNI)**
- **Very remote area**
- **Flat land, stable geology**
- **Water availability and quality**
- **Proximity to transmission line (3 paths)**

These traits make the Red Lake site <u>one of the best in the entire world</u>

- 4,000 acres
- Private Land
- 27 miles North of Kingman, Arizona
- Mohave County



State & National Requirements

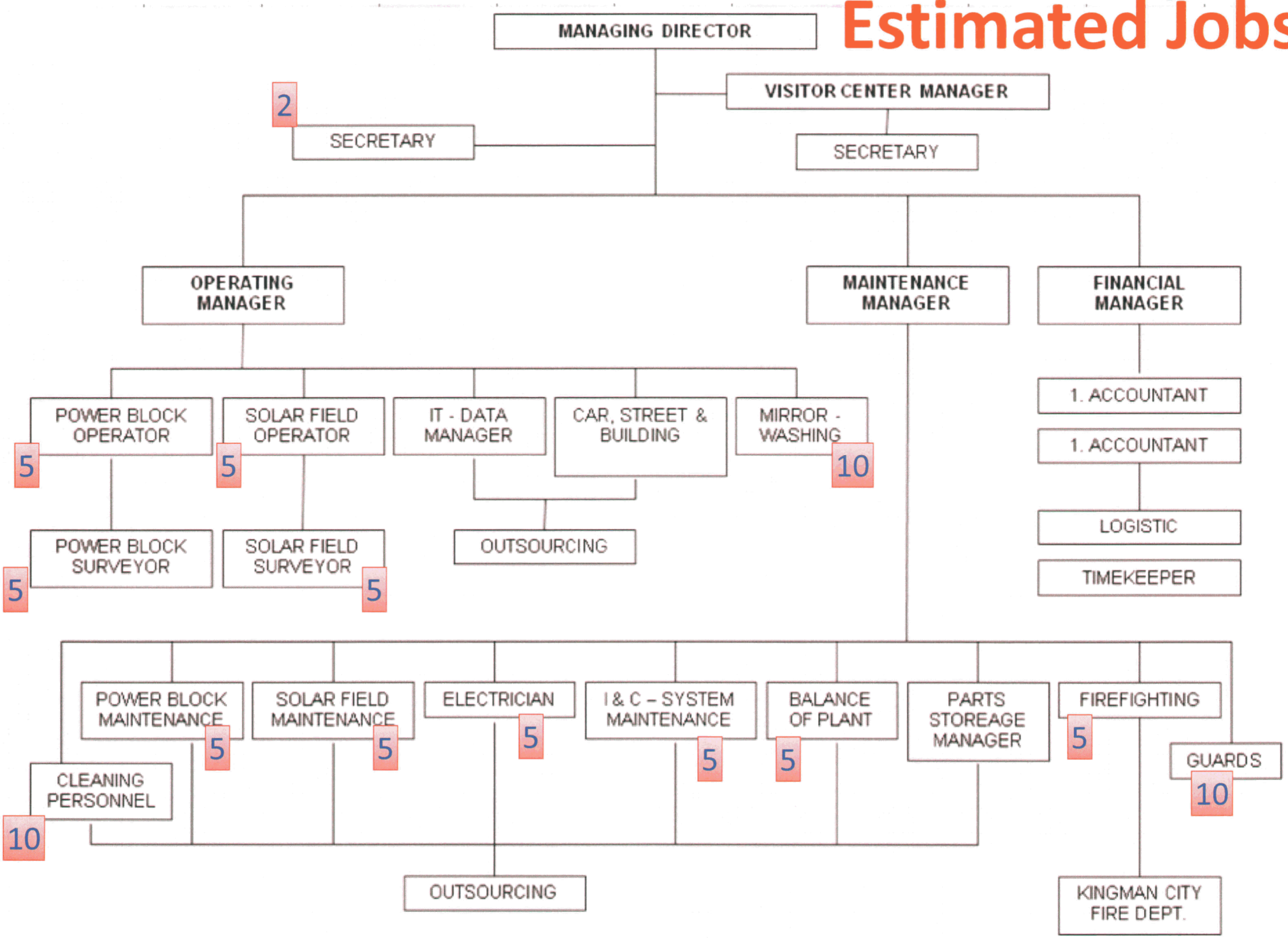
- Several states have identified Renewable Portfolio Standards (RPS)
  - **AZ 15% by '25 / CA 33% by '20 / NV 25% by '25**
- Obama goal of doubling renewable energy in the next 3 years (Feb 24 '09 State of the Union)
  - More than $100 billion on foreign oil and >$25 billion to Persian Gulf states per year
- Renewable energy results in significantly lower greenhouse gas emissions and a smaller carbon footprint than fossil fuel power plants

Estimated Economic Impact

Sources: Fichtner Solar GmbH (Stuttgart), Applied Economics (Phoenix), NREL, various published studies

- Once operational, the HVS project would have ***an annual economic impact of more than $20 million to Mohave County***
- A capital investment of nearly $2 billion in land, buildings and equipment
  - This investment in Mohave County would generate more than $4 million in local property taxes each year to the county and local schools.
  - Each $1 spent contributes approximately $1.50 to AZ Gross State Product (NREL)
- Construction Period (3 years, beginning late-2010)
- 1,500 jobs (direct, at project peak), plus secondary and tertiary jobs
- $30 million in total direct and indirect construction income generated in Mohave County
- Potential to generate up to $5 million in one-time state and local construction sales tax
- + wages put back into local economy for housing, food, transportation, entertainment, etc.
- + local goods and materials purchased for the Project
- Operation (beginning in late 2013, for 25-30 years):
- 100+ fulltime jobs (supporting 300+ people), plus an additional 30 indirect jobs at *other local businesses* (the result of B2B purchases made by HVS as well as employee spending)
- A $4 million annual payroll would create significant local retail expenditures by employees and their families; through the multiplier effect, this would result in a total annual personal income impact of more than $5.5 million in Mohave County

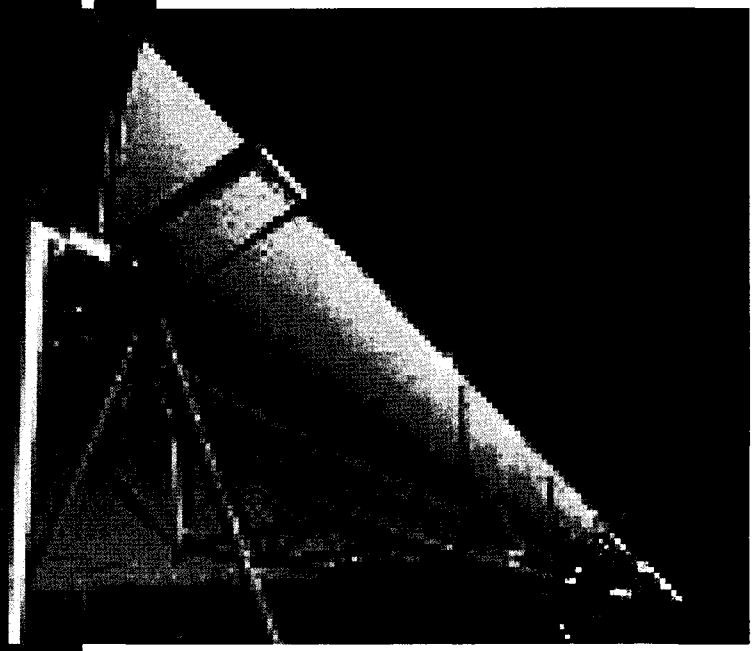
Estimated Jobs



The HVS Power Plant

- **4,000 "Collectors" (troughs)**
  - Each collector is ~500 ft X 20 ft
  - 30 million ft^2 of solar field (mirrors)
  - 50 ft between collectors
  - Land area of collectors ~3,000 acres
- **340 MW turbine**
- **Up to 8 hours of energy storage**

Power plant begins operation late 2013



Process and Schedule

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a mohave sun power project

Process

- **This is only the first step in our public process**
- **Future steps include**
  - Public meetings starting on July 15 to share information with and get comments from the public on the Project as part of the PNZ process
  - Public meetings with the PNZ Commission and BOS
  - Public meetings for ACC approval process
  - Public meeting for air permit
  - Public meetings for the Federal approval process

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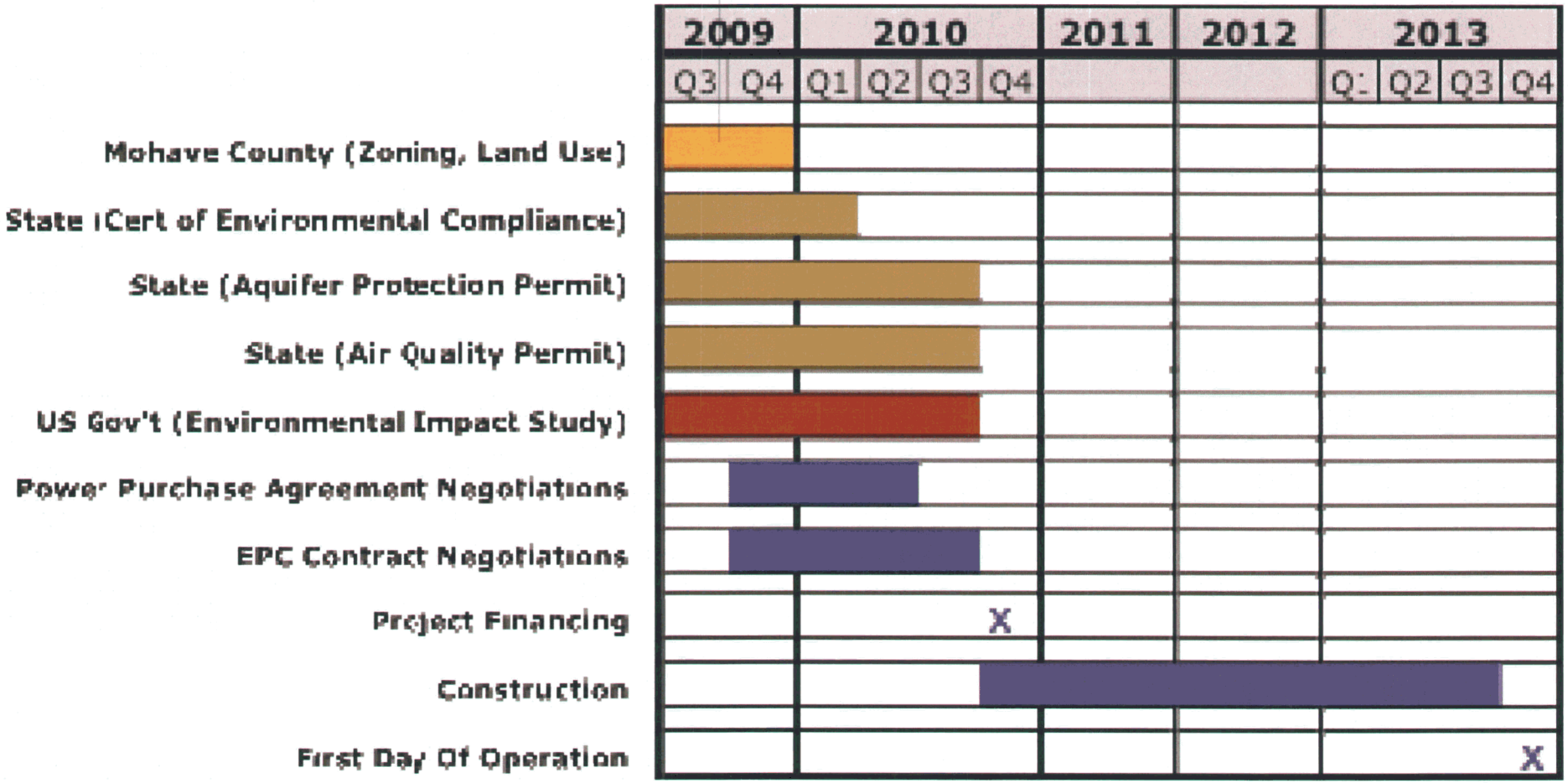
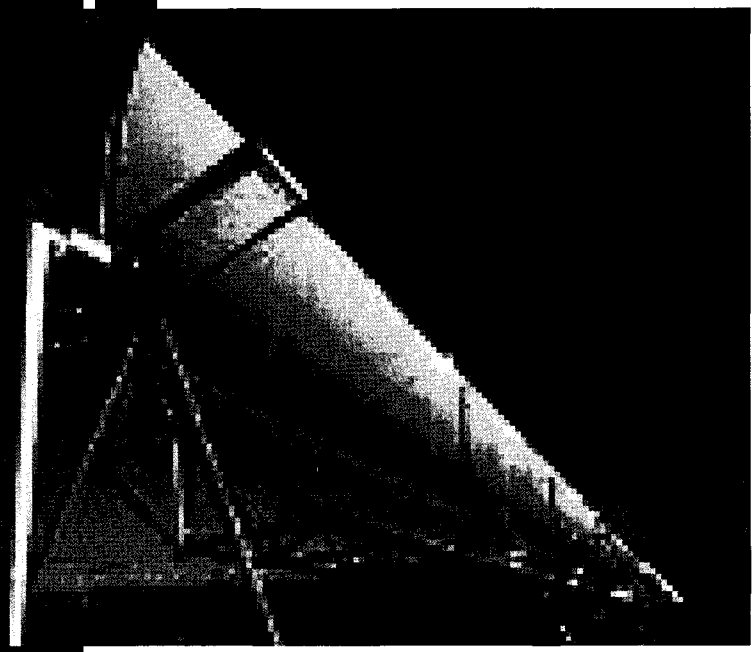
Project Schedule





Solar Technology

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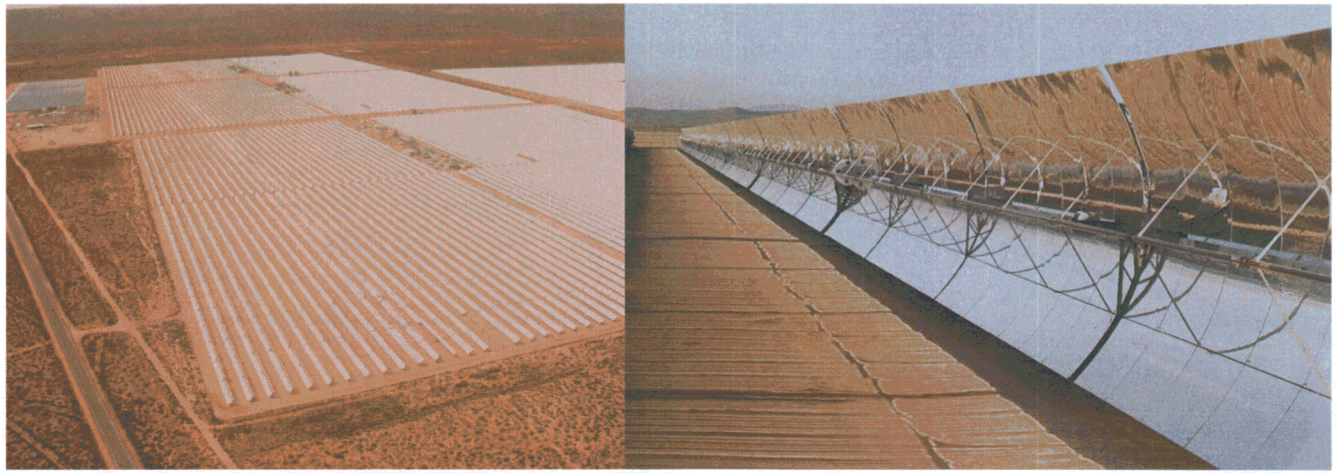
Solar Power Technologies



- HVS has selected solar trough technology supplemented by thermal storage provided by molten salts
- Solar trough is proven on utility scale (1984 SEGS through current projects in Spain)
- Thermal storage provides flexibility to generate when the users need electricity - not just when the sun shines or wind blows

Cooling Technologies

PRELIMINARY PROJECT DESIGN

- Preliminary project design is based on evaporative cooling
- Standard design because it is typically the most efficient and cost effective
- Provides the greatest potential for project to be successful in securing a PPA and ultimately being constructed

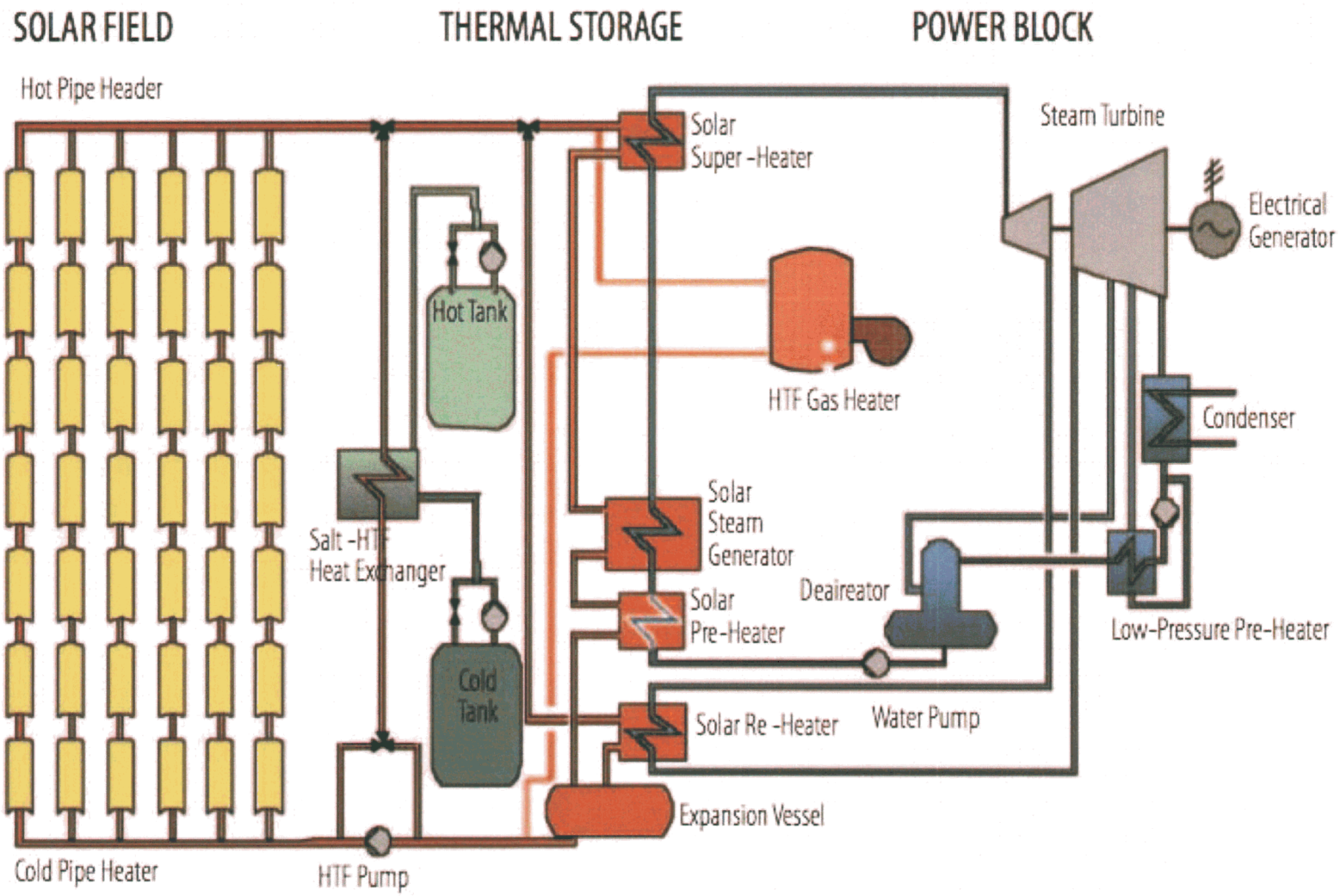
PROVEN TECHNOLOGIES FOR COOLING

- Once through cooling water
  - Lowest capital cost
  - Most efficient
  - Requires large amount of water (~150,000 AF/Y), but none is lost
- Wet or evaporative cooling
  - Moderate capital cost, including water treatment system
  - High efficiency
  - Relies on water being lost to evaporation (~2,200 AF/Y) for cooling
- Dry Cooling
  - High capital and operating cost
  - Lower energy efficiency and especially low during hot dry periods when energy is needed most
  - Higher energy usage to run the system
  - No water consumption for cooling
  - Typically used where water is not available, or where it is too costly to treat
- Hybrid Cooling
  - Highest capital cost (almost combination of evaporative and dry)
  - Bias to wet cooling during high heat periods and dry cooling during cooler periods to minimize energy and efficiency loses
  - Water consumption from 10-90% of evaporative cooling

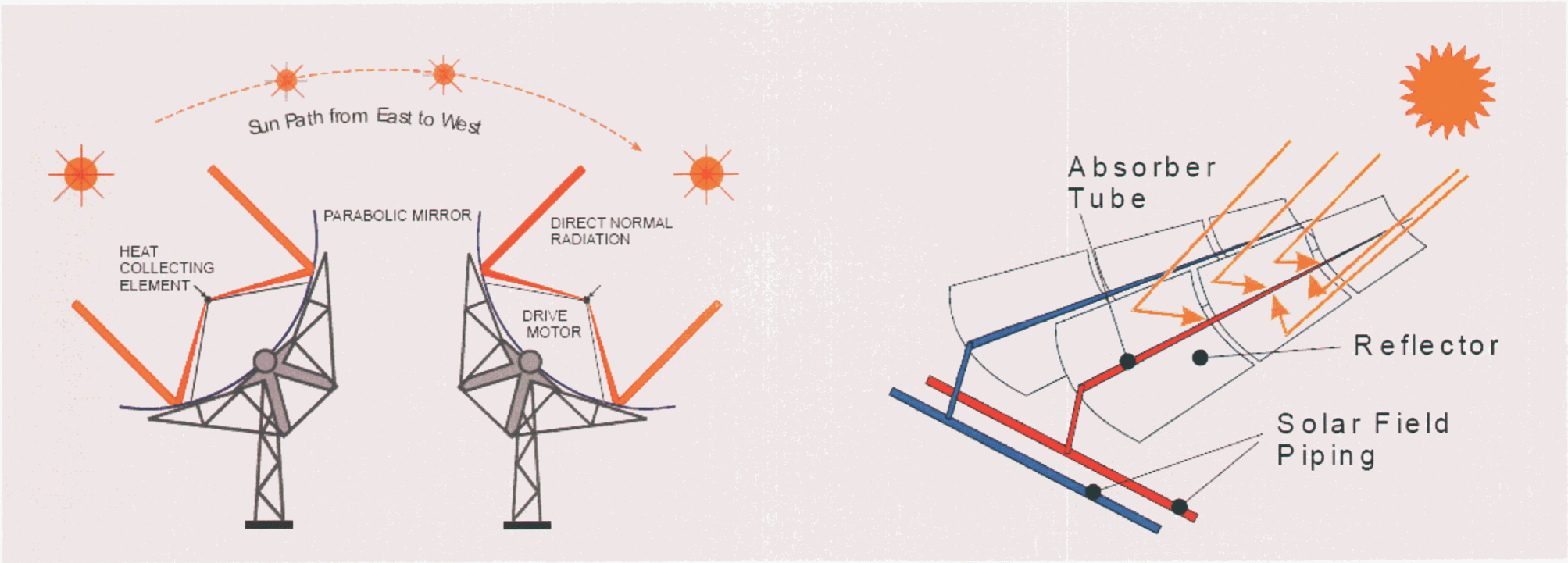
RESPONSIBLE WATER USE

- National effort ongoing through DOE to decrease water consumption:
  - Nexant Parabolic Trough Solar Power Plant Systems Analysis, Task 2: Comparison of Wet and Dry Rankine Cycle Heat Rejection, July 2006, (http://www.nrel.gov/csp/troughnet/pubs_power_plant.html)
  - Hybrid Wet/Dry Cooling for Power Plants, Parabolic Trough Technology Workshop, February 14, 2006, (http://www.nrel.gov/csp/troughnet/wkshp_2006.html)
  - Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation, Report to Congress, US DOE, (http://www.nrel.gov/csp/troughnet/pubs_power_plant.html)
  - Comparison of Alternate Cooling Technologies for California Power Plants, Economic, Environmental, and Other Tradeoffs, California Energy Commission, February 2002, (http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=P500-02-079F)

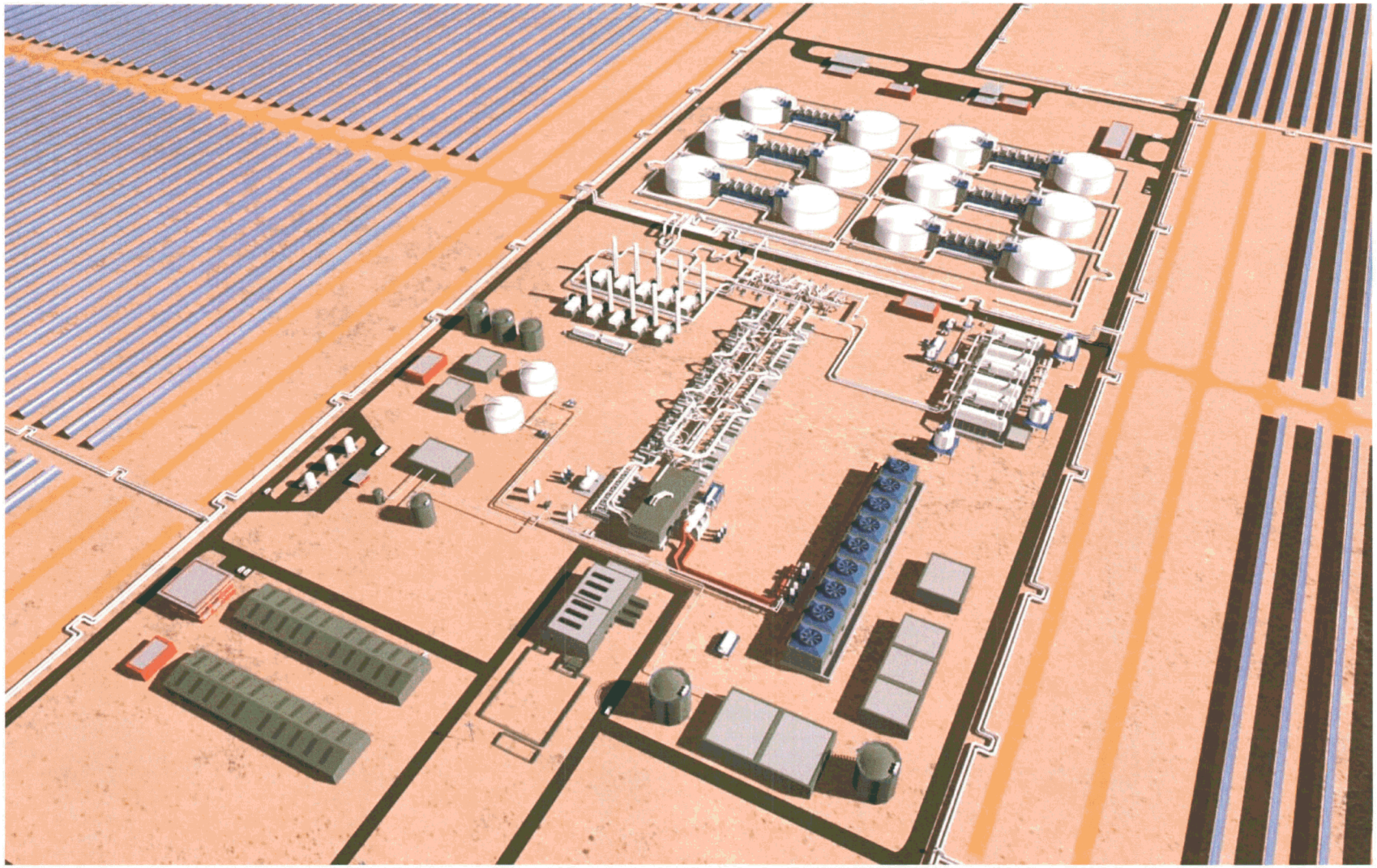
Solar Plant Schematic

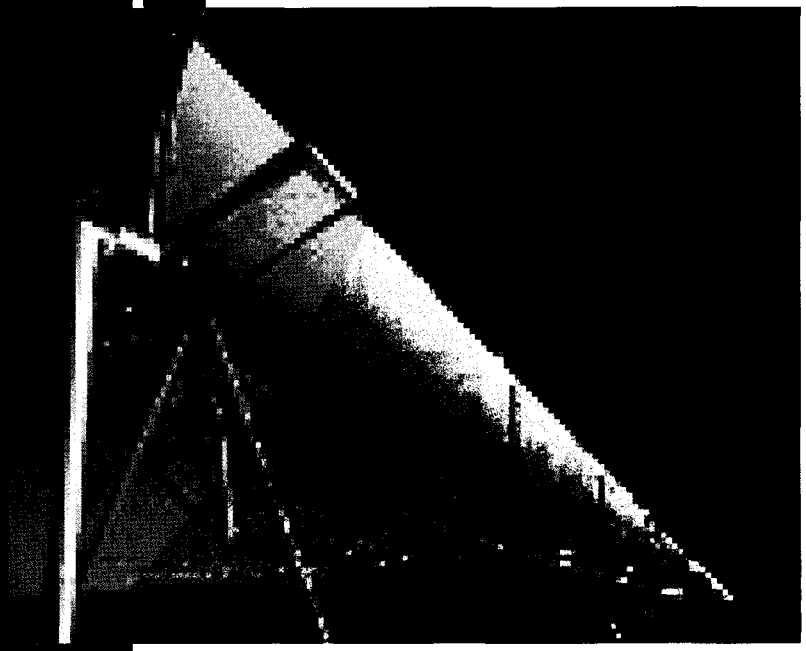


Solar Trough Operation



Power Block Visualization





Site Details and Environmental Aspects

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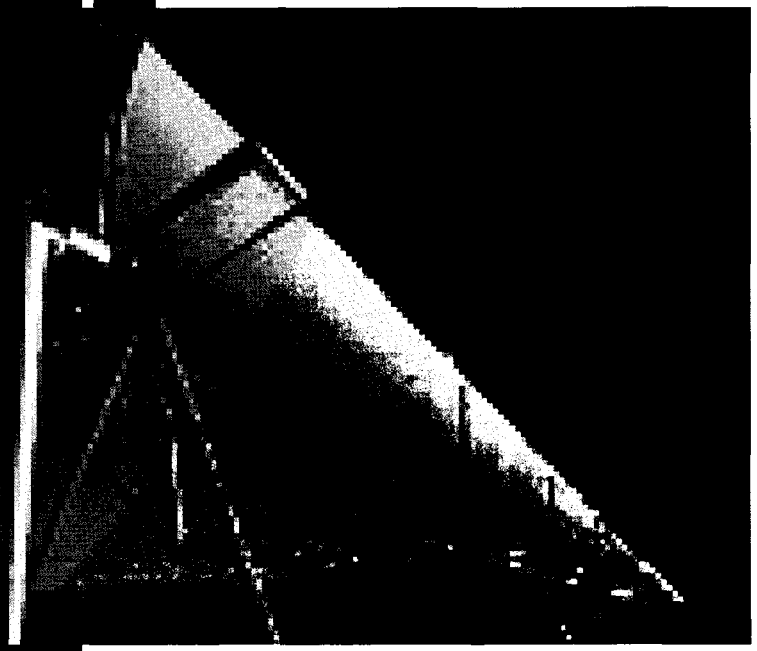
Environmental Aspects

- Baseline studies are ongoing and **no fatal flaws** have been identified for:
  - Air Quality
  - Biology
  - Cultural
  - Geology and Soils
  - Land Use
  - Health, Safety, and Noise
  - Recreation
  - Socioeconomics
  - Visual Resources

Environmental Aspects

- EIS is being prepared for NEPA
  - process that includes analysis of environmental impacts, as well as many opportunities for public participation
- Provide clean, renewable energy primarily during peak usage periods, thus offsetting greenhouse gas emissions from fossil fuel power plants
- Visually, the solar field has a minimal height, with the tallest structures being standard transmission lines



Water

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AVAILABLE GROUNDWATER SUPPLY

- Groundwater is stored in thick alluvial deposits that fill the Hualapai basin
- Projected raw water demand = **3,000 AF/yr** average
  = **1,860 gpm** continuously
- One conceptual plan includes 3 wells plus 1 backup
- Projected life of solar plant = 30 yrs
- Total groundwater use over time = **90,000 AF / 30 yrs**
- Groundwater recharge/discharge and storage in basin
  - Natural Recharge equals Natural Discharge = **3,800 AF/yr**
  - Groundwater in Storage above depth of 1,200 feet = **15.8 million AF**
  - Groundwater in Storage above bedrock and salt = **27.7 million AF**

GROUNDWATER FLOW MODEL

- **Regulatory Agency Vetting and Calibration**
  - Arizona Dept. of Water Resources scientists critically reviewed the model and approved it for use in projecting impacts of pumping in the basin
  - Very good calibration of the model to measured water levels for historical pumping from 1970 through 2005

- **Model Construction**
  - 2 model layers: Layer 1 = Upper Basin-Fill (includes Red Lake playa deposits)
    Layer 2 = Lower Basin-Fill and Volcanics
  - Grid cell spacing = uniform ¼ mile in the horizontal direction
  - Saturated Thickness of Model Layer 1 = 0 to 600 feet
  - Saturated Thickness of Model Layer 2 = 0 to 3,800 feet

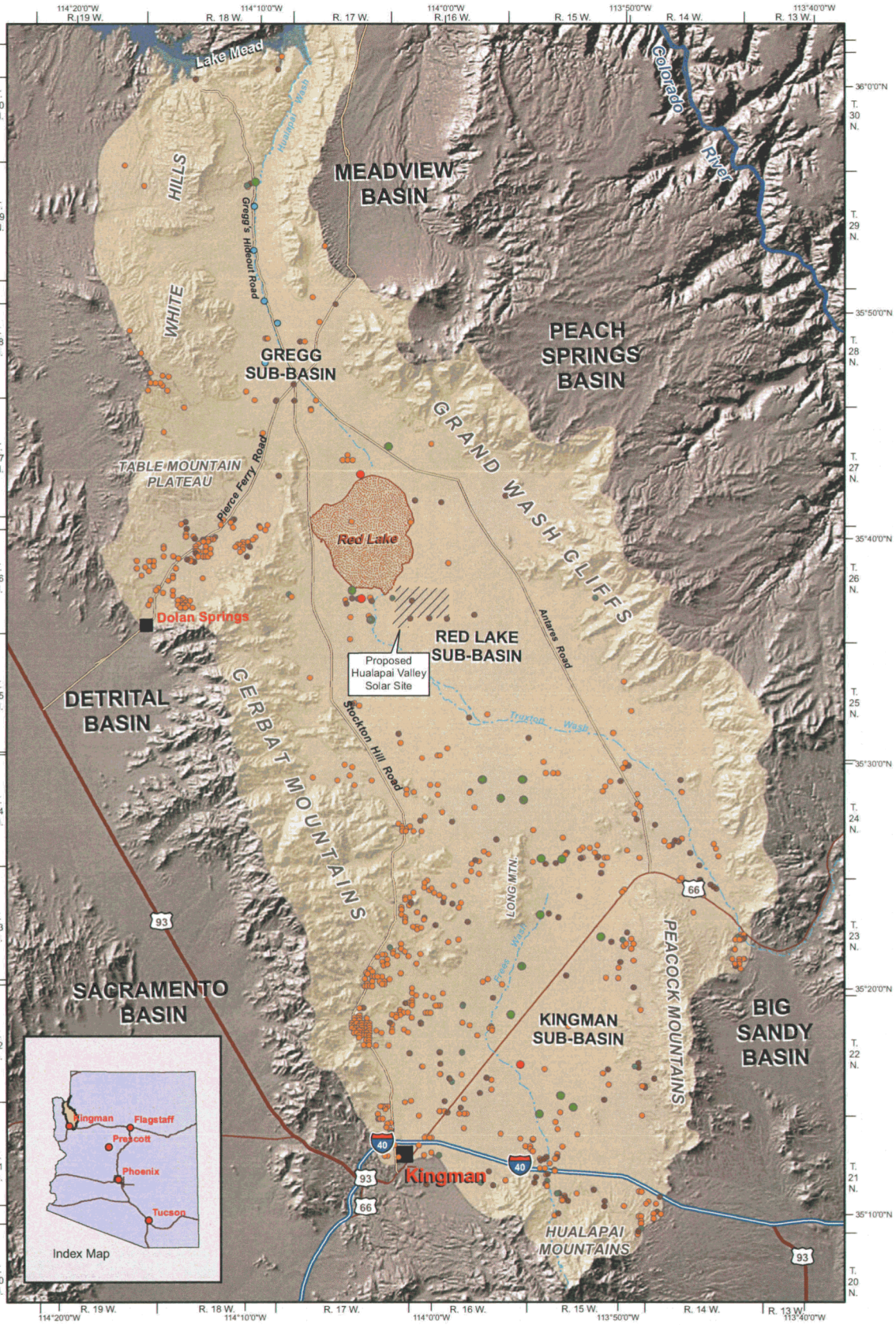
- **Hydrogeologic Properties**
  - Hydraulic conductivity ranges from 0.5 foot per day for Long Mountain area to 100 feet per day for area south from Gregg Sub-basin
    - Hydraulic conductivity values based on pumping test data and groundwater level calibration results
  - Specific Yield: Playa Deposits = 8 percent
    Upper Basin-Fill = 12 percent
    Volcanics = 2 percent
    Lower Basin-Fill = 10 percent
- **Recharge**
  - Assuming that recharge equals basin discharge during pre-development, recharge value from literature = 3,800 AF/yr
  - 70 percent is distributed among mountain-fronts
    30 percent is distributed among ephemeral stream channels

- **Boundary Conditions**
  - Head at Lake Mead remains constant at 1,200 feet above mean sea level
  - All other boundaries are no-flow

- **Transient Simulation**
  - Pre-development period assumed before 1970
  - Transient simulation from 1970 through 2112
  - Annual stress periods

- **Groundwater Pumping**
  - Total pumping with Hualapai Valley Solar Plant = 19,003 AF/yr
  - Hualapai Valley Solar Plant = 3,000 AF/yr distributed among 4 wells
  - Hualapai Valley Solar Plant wells begin pumping at the beginning of 2013

MONTGOMERY & ASSOCIATES



EXPLANATION

- Well from ADWR Groundwater Site Inventory
- Well from ADWR 55 Registry Inventory
- Well from ADWR 35 Registry Inventory
- New Well or Existing Well Tested by Montgomery and Associates
- Well Inventoried by Montgomery & Associates
- Mardian Ranch Wells
- Groundwater Basin Boundary (ADWR, 2005a)
- Bedrock Boundary (AZGS, 1998; Remick, 1981; Gillespie and Bentley, 1971)

0 1 2 3 4 5
Miles

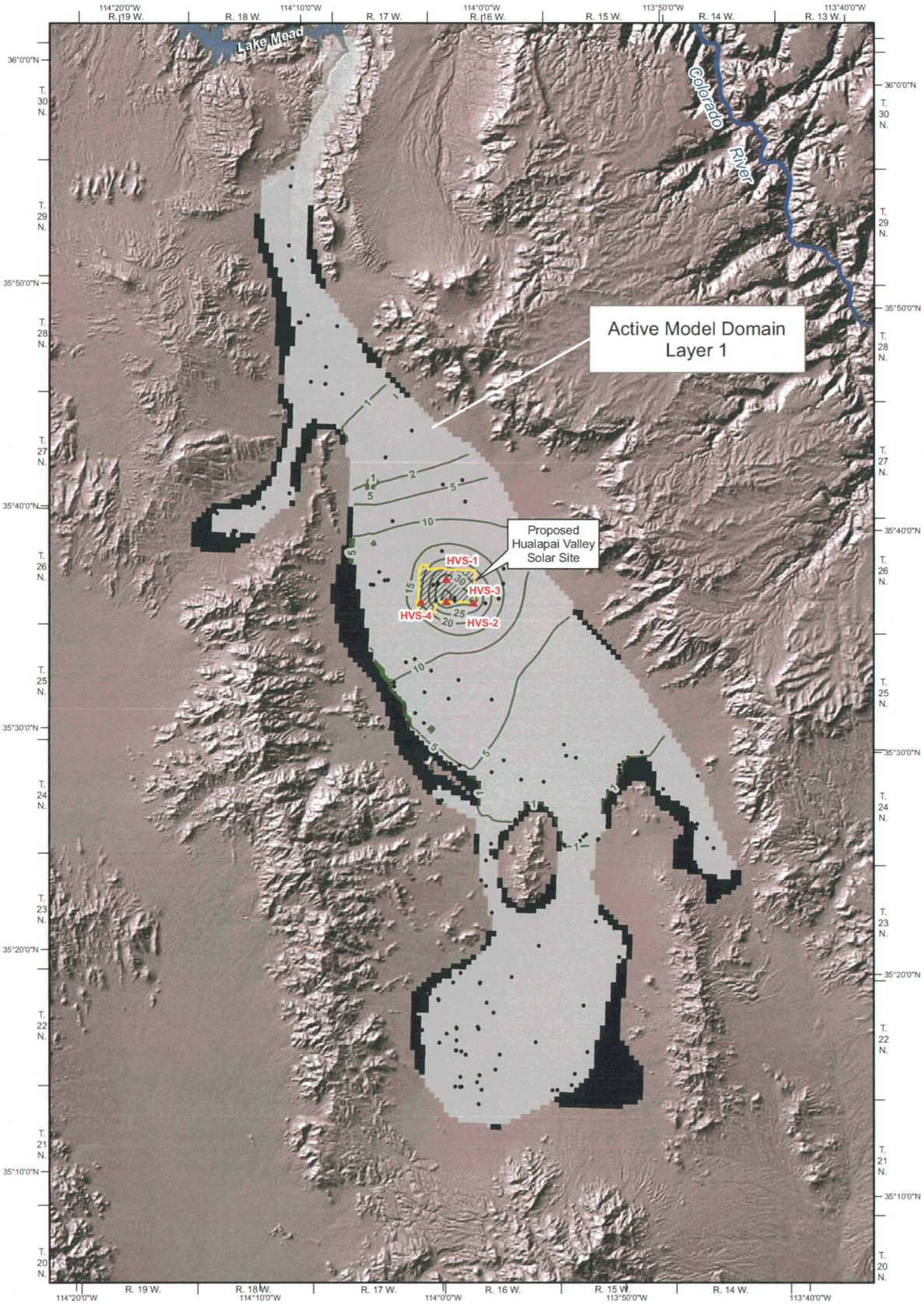
N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

LOCATION MAP
FOR HUALAPAI
GROUNDWATER BASIN

MONTGOMERY & ASSOCIATES
2006

GIS-Tuc/1326.02/POSTER_Cultural_RedLake.mxd/09July2009



EXPLANATION

Projected groundwater level decline, in feet due to Hualapai Valley Solar Plant after 30 years of pumping

HVS-1 ▲ Proposed Location of Hualapai Valley Solar Plant Well, and Identifier

• Other Wells Simulated in Groundwater Model

—— 5 —— Groundwater Level Decline Contour, in feet (maximum decline = 38 feet)

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

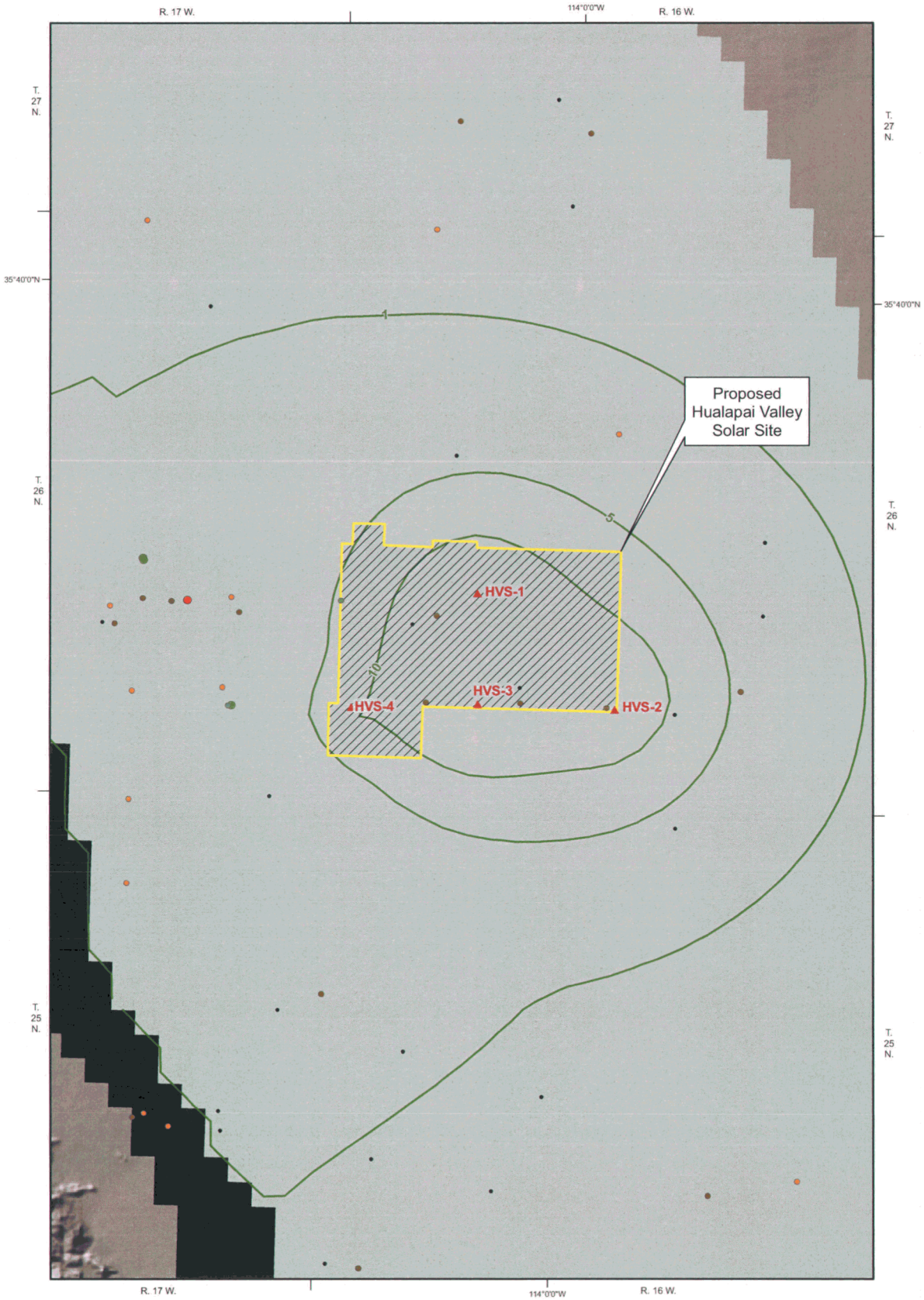
N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED
GROUNDWATER LEVEL
DECLINE AT END OF 2042

MONTGOMERY & ASSOCIATES
Water Resource Consultants
2009

GIS-Tuc\POSTER_WL_dd_30yrs\09July2009



EXPLANATION

Projected groundwater level decline, in feet due to Hualapai Valley Solar Plant after 5 years of pumping

HVS-1 ▲ Proposed Location of Hualapai Valley Solar Plant Well, and Identifier

• Other Wells Simulated in Groundwater Model

• Well from ADWR Groundwater Site Inventory

• Well from ADWR 55 Registry Inventory

• Well from ADWR 35 Registry Inventory

• New Well or Existing Well Tested by Montgomery and Associates

• Well Inventoried by Montgomery & Associates

—5— Groundwater Level Decline Contour, in feet (maximum decline = 22.5 feet)

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2
Miles

N

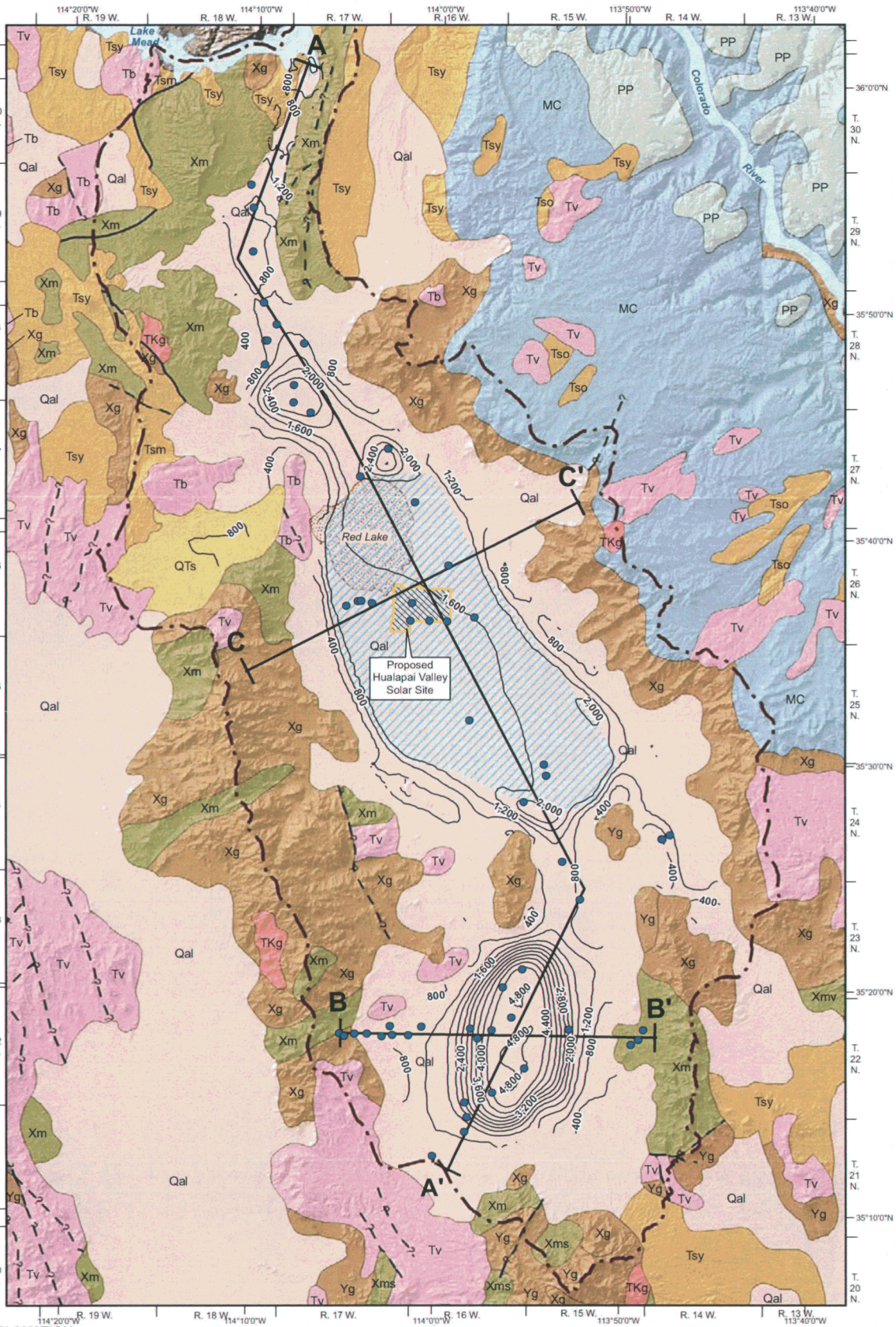
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL DECLINE AT END OF 2017

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2009

GIS-Tuc/1326/02/POSTER_DD_5YRS_zoom.mxd/09Jul2009



EXPLANATION

Qal	Quaternary Alluvium
QTs	Quaternary-Tertiary Sandstone and Conglomerate
Tsy/Tsm/Tso	Pliocene-Miocene (Tsy), Miocene-Oligocene (Tsm), and Oligocene-Paleocene (Tso) Sedimentary Rocks
Tb/Tv	Tertiary Basaltic (Tb) and Other Volcanic (Tv) Rocks
TKg	Tertiary-Cretaceous Granitic Rocks
PP	Permian-Pennsylvanian Sandstone, Limestone, Dolomite
MC	Mississippian-Cambrian Sandstone, Limestone, Dolomite
Yg/Xg	Middle (Yg) - Lower (Xg) Proterozoic Granitic Rocks
Xm/Xms/Xmv	Lower Proterozoic Metamorphic (Xm), Metasedimentary (Xms), and Metavolcanic (Xmv) Rocks
	Extent of Evaporite Deposits (from ARCADIS, 2000)
	Well Location
— —?—	High-angle Fault, queried where uncertain
	Low-angle Normal Fault
	Groundwater Basin Boundary (ADWR, 2005a)
	Line of Section
—400—	Depth Contour, in feet, to Top of Bedrock or Evaporite Deposits (see text for basis)

(Geology modified from AZGS, 1998)

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

GEOLOGIC MAP OF HUALAPAI VALLEY

MONTGOMERY & ASSOCIATES

2007

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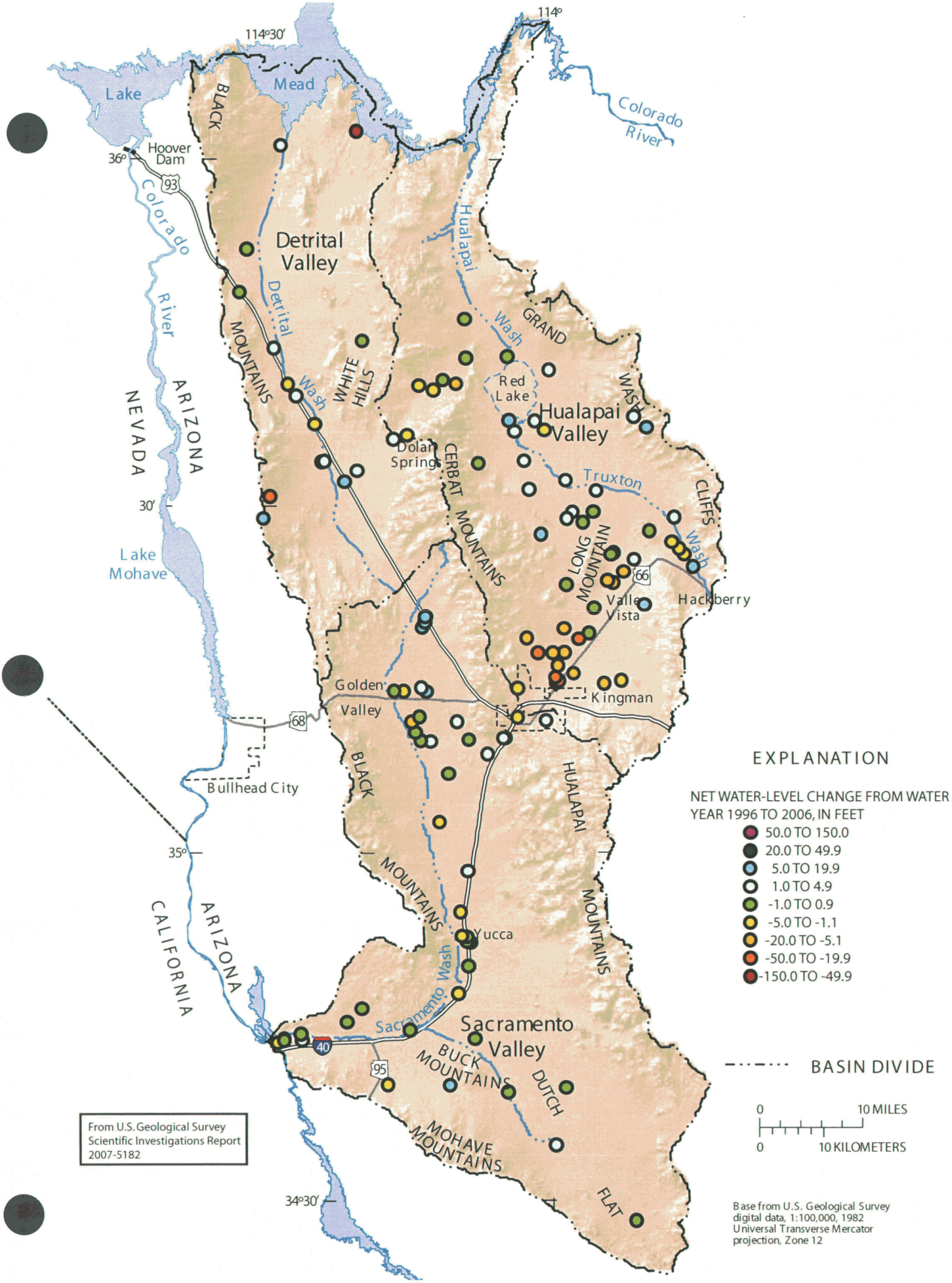
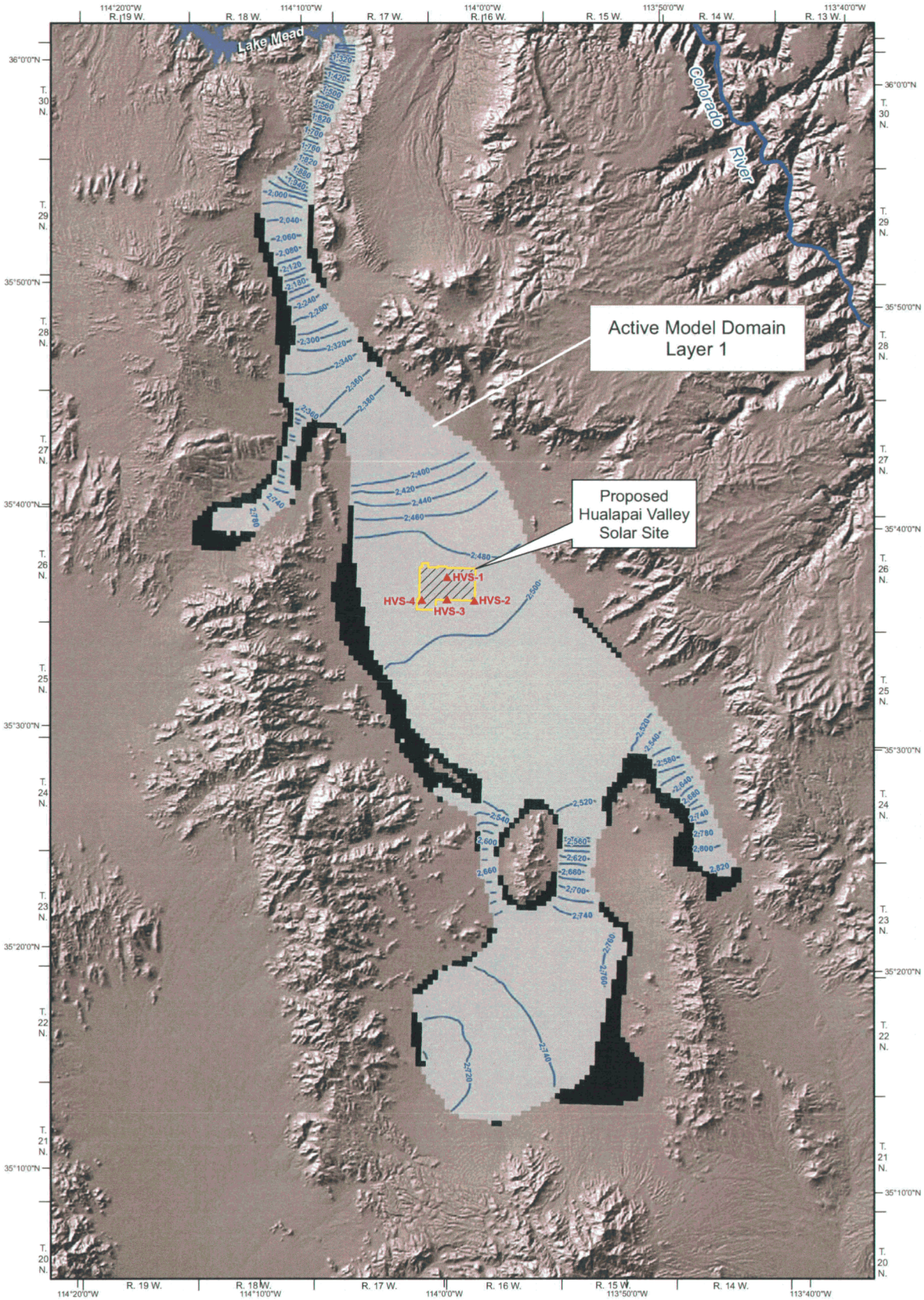


FIGURE 3. Net water-level change from water year 1996 to 2006 for selected wells, Detrital, Hualapai, and Sacramento Valley Basins, Mohave County, Arizona.



EXPLANATION

Projected groundwater level altitude, in feet above mean sea level, before development of the Hualapai Valley Solar Plant

HVS-1 ▲ Proposed Location of Hualapai Valley Solar Plant Well, and Identifier

—2,500— Groundwater Level Altitude Contour, in feet msl

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

N

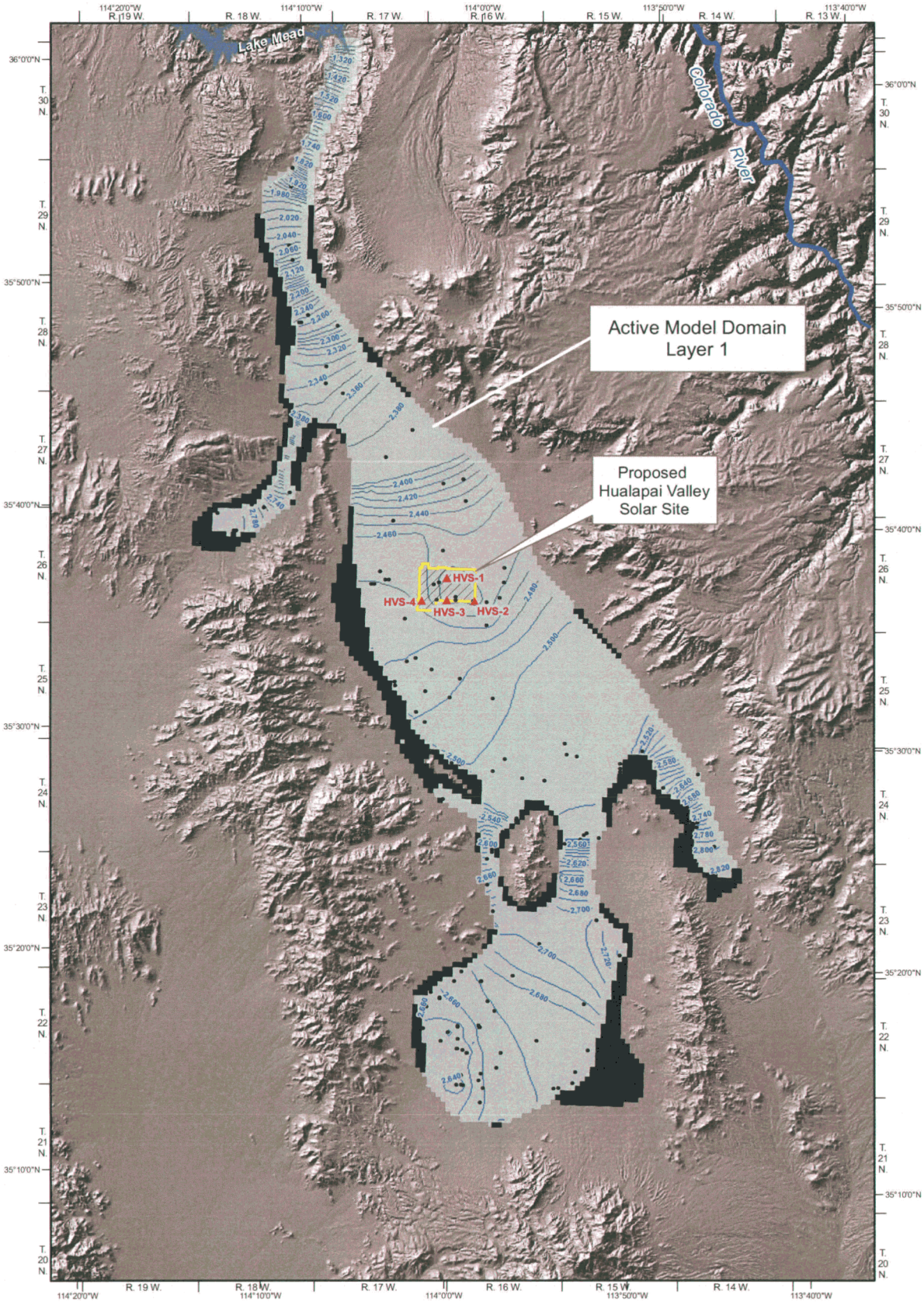
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL ALTITUDE AT END OF 2012

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2009

GIS-Tuc/1326/02/POSTER_WL_2012.mxd/09Jul2009



EXPLANATION

Projected groundwater level altitude, in feet above mean sea level, after 30 years of pumping at the Hualapai Valley Solar Plant

HVS-1 ▲ Proposed Location of Hualapai Valley Solar Plant Well, and Identifier

• Other Wells Simulated in Groundwater Model

—2,500— Groundwater Level Altitude Contour, in feet msl

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

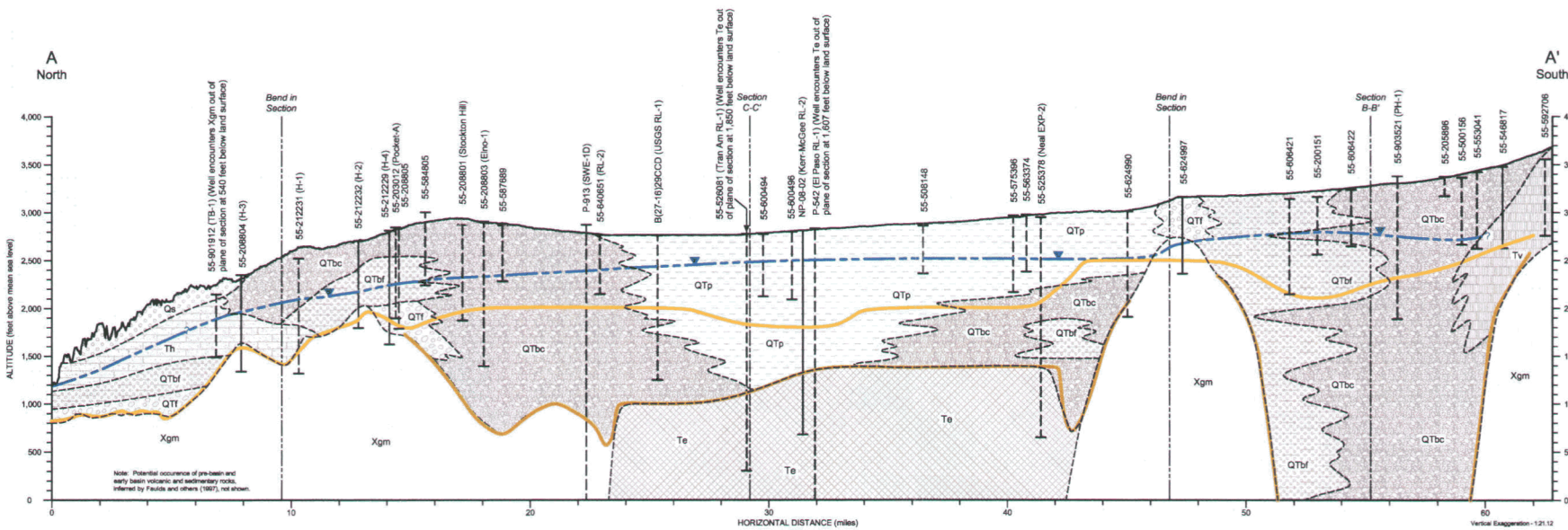
N

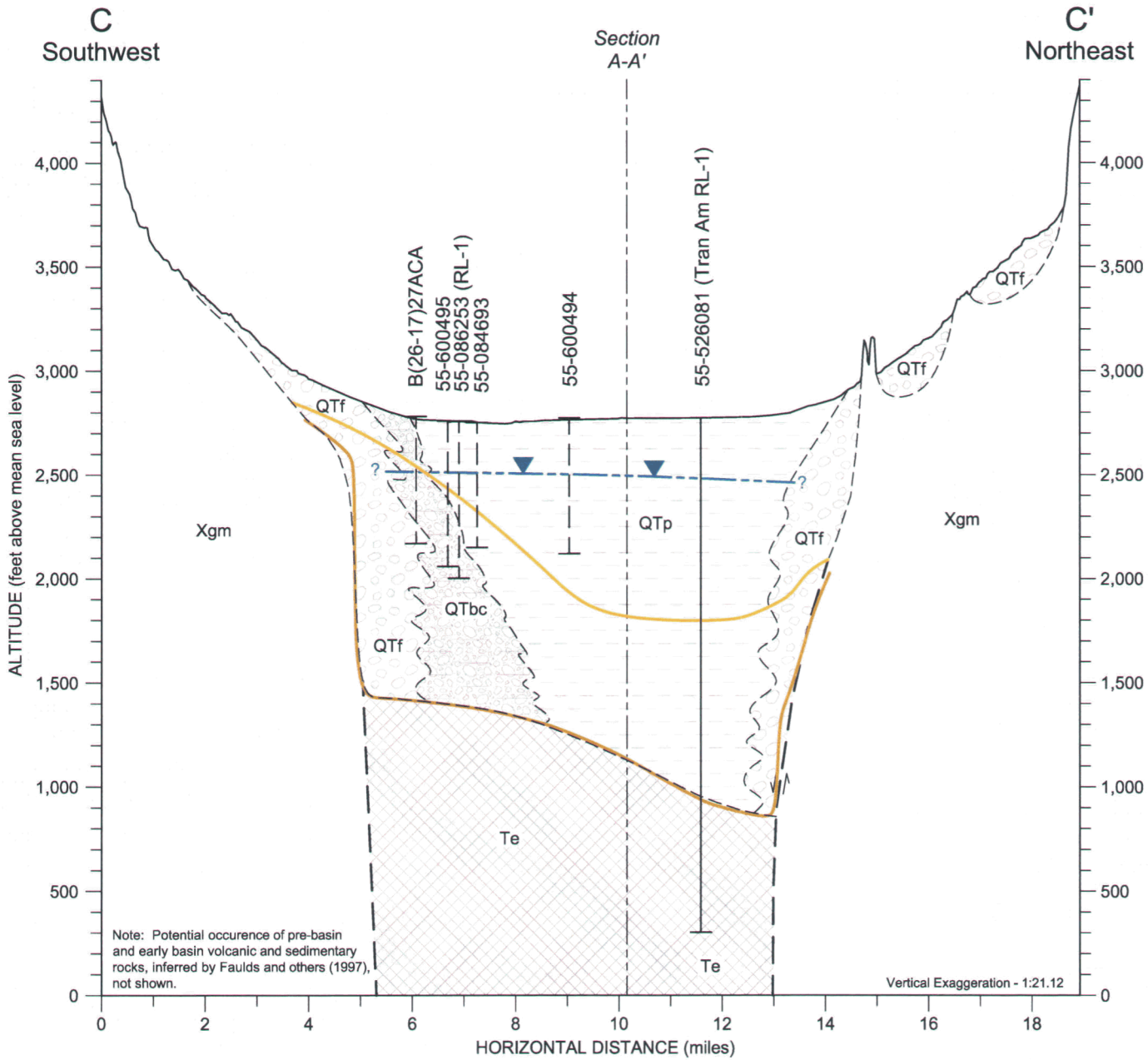
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL ALTITUDE AT END OF 2042

MONTGOMERY & ASSOCIATES
Water Resource Consultants
2009

GIS-Tuc/1326/02/POSTER_WL_30yrs.mxd/09Jul2009


A
North
A'
South
Bend in Section
Section C-C'
Section B-B'
55-901912 (TS-1) (Well encounters Xgm out of plane of section at 540 feet below land surface)
55-208804 (H-3)
55-212231 (H-1)
55-212232 (H-2)
55-212229 (H-4)
55-203012 (Pocket-A)
55-208805
55-584805
55-208801 (Stockton Hill)
55-208803 (Elmo-1)
55-587688
P-913 (SWE-1D)
55-640651 (RL-2)
B(27-16)29CCD (USGS RL-1)
55-526081 (Tran Am RL-1) (Well encounters Te out of plane of section at 1,850 feet below land surface)
55-600494
55-600496
NP-08-02 (Kerr-McGee RL-2)
P-542 (El Paso RL-1) (Well encounters Te out of plane of section at 1,607 feet below land surface)
55-508148
55-575396
55-563374
55-525378 (Neal EXP-2)
55-624990
55-624987
55-606421
55-200151
55-606422
55-903521 (PH-1)
55-205896
55-500156
55-553041
55-548817
55-592706
ALTITUDE (feet above mean sea level)
HORIZONTAL DISTANCE (miles)
Vertical Exaggeration - 1:21.12
Qs
Th
QTbf
QTf
QTbc
QTp
Xgm
Te
Tv
Note: Potential occurence of pre-basin and early basin volcanic and sedimentary rocks, inferred by Faulds and others (1997), not shown.
EXPLANATION
Qs — QUATERNARY STREAM ALLUVIUM - Sand and gravel recently deposited in stream channels; may locally contain silt or clay lenses; also may include terrace deposits
QTp — QUATERNARY TO TERTIARY PLAYA AND OTHER FINE-GRAINED DEPOSITS - Deposits consisting primarily of clay and/or claystone; most of these deposits are associated with the Red Lake Playa and its pre-Quaternary predecessor; but also include lacustrine claystone and other fines deposited near basin centers; may locally contain evaporites, sand and gravel lenses
QTf — QUATERNARY TO TERTIARY ALLUVIAL FAN DEPOSITS - Deposits consisting primarily of gravel, cobbles, or boulders with sand, and a minor percentage of fines, including both consolidated and unconsolidated sediment; deposited mostly as an upper-fan facies
QTbc — QUATERNARY TO TERTIARY COARSE BASIN FILL - Sand and/or gravel deposits with some clay or silt beds; typically formed as a mid-fan facies, but also represents older deposits formed during early phases of basin development
QTbf — QUATERNARY TO TERTIARY FINE BASIN FILL - Clay and/or silt with some sand or gravel; typically formed as a lower-fan facies, but includes other moderately fine materials deposited in or adjacent to basin centers
Th — TERTIARY HUALAPAI LIMESTONE - Sandy to clayey limestone; may locally contain claystone or gravel
Te — TERTIARY EVAPORITES - Halite deposits associated with the Miocene-age Red Lake Playa; contains clay, silt and anhydrite; the halite body is capped by up to 150 feet of anhydrite and lesser amounts of gypsum
Tv — TERTIARY VOLCANICS - Silicic to mafic flows and pyroclastic rocks; includes some sub-volcanic intrusions (modified from AZGS, 2000)
Xgm — PROTEROZOIC GRANITIC AND METAMORPHIC ROCKS - Granite, granodiorite, tonalite, quartz diorite, diorite, and gabbro; undifferentiated metasedimentary, metavolcanic and gneissic rocks; commonly foliated (modified from AZGS, 2000)
55-548817 — Well Identifier
Well (dashed where projected to line of section). (Arizona Department of Water Resources well registration number listed, if available; otherwise Arizona Oil and Gas file number or cadastral location listed. Well names in parenthesis.)
Groundwater Level (2005 - 2006 contour map)
Approximate Base of Model Layer 1
Approximate Base of Model Layer 2
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA
HYDROGEOLOGIC SECTION A-A'
2007
MONTGOMERY & ASSOCIATES



EXPLANATION

QTp	QUATERNARY TO TERTIARY PLAYA AND OTHER FINE-GRAINED DEPOSITS - Deposits consisting primarily of clay and/or claystone; most of these deposits are associated with the Red Lake Playa and its pre-Quaternary predecessor, but also include lacustrine claystone and other fines deposited near basin centers; may locally contain evaporites, sand and gravel lenses
QTf	QUATERNARY TO TERTIARY ALLUVIAL FAN DEPOSITS - Deposits consisting primarily of gravel, cobbles, or boulders with sand, and a minor percentage of fines, including both consolidated and unconsolidated sediment; deposited mostly as an upper-fan facies
QTbc	QUATERNARY TO TERTIARY COARSE BASIN FILL - Sand and/or gravel deposits with some clay or silt beds; typically formed as a mid-fan facies, but also represents older deposits formed during early phases of basin development
Te	TERTIARY EVAPORITES - Halite deposits associated with the Miocene-age Red Lake Playa; contains clay, silt and anhydrite; the halite body is capped by up to 150 feet of anhydrite and lesser amounts of gypsum
Xgm	PROTEROZOIC GRANITIC AND METAMORPHIC ROCKS - Granite, granodiorite, tonalite, quartz diorite, diorite, and gabbro; undifferentiated metasedimentary, metavolcanic and gneissic rocks; commonly foliated (modified from AZGS, 2000)
55-526081	Well Identifier
	Well (dashed where projected to line of section) (Arizona Department of Water Resources well registration number listed, if available; otherwise Arizona Oil and Gas file number or cadastral location listed. Well names in parenthesis.)
	Groundwater Level (2005 - 2006 contour map)
	Approximate Base of Model Layer 1
	Approximate Base of Model Layer 2

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

HYDROGEOLOGIC SECTION C-C'

2007

MONTGOMERY & ASSOCIATES
Water Resource Consultants

1326.02\POSTER_XS_CC\07July2009

QUESTIONS:

1-877 487-1437

info@HualapaiValleySolar.com

www.hualapaivalleysolar.com

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HUALAPAI VALLE
OPEN
SIGN I
July 1
Valle Vista

Name (please print clearly)	[illegible]tion	Phone Number	
Robert Beaulaid		909 289-4775	P.O.
DAN HOPPING		~~7822~~ 928-757-3733	7822
KIM R. GAINES		928-757-8257	755
KARL TAYLOR		928 757 0903	367[illegible]
2 JOHN & Judi Scaliatine	93AG-S	909-717-3589	1176
Debra & Butch Martin		928 681 6898	737
Sigrid & Kate Crowder		928 715 7557	70
VICTOR K. FORSBERG	LAIZON INC.	928-303 4161	425
Dobbie Gallacher	———	928-757-3346	974
Suzanne Adams	Kingman Daily Miner	928-753-6397	3015
Roy R. Tremy		928-769-2878	1100
Jim Kanelos	SVS	928-505-2453	4402
PATTI LEWIS		928-757-4972	585[illegible]
DANA DAVIS		928-692-4922	7111E
GLENN HOAG		586-484-1095	747[illegible]

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SOLAR PROJECT
HOUSE
SHEET
, 2009
Country Club

Mailing address	Heard? (newspaper/ad/flyer)
Box 8391 Redlands CA 92375	Flyer
MONTE TESORO KINGMAN AZ 86401	FLYER
E. CAYUSE CT Kingman, AZ	FLYER
HWY 66, MOHAVE COUNTY	
E. Big ELK DR. KINGMAN AZ 86401	
E. Dome Rock D	86401
Box 963 Meadview 86444	Mailed Prepaid
Santa Fe Dr Kingman AZ	Industrial Info. Con (PEC Report)
9N Vista Dr Kingman	website
Stockton Hill Rd	
E. Sprucelaw Valley DR. Kingman	Newspaper
Oatman Rd Golden Valley AZ 86413	SVSINC@live.com
N CORAL BAY King 86409	LAST MTG.
BROOKS BLVD KINGMAN AZ 86401	Mailer
SAWMILL DR. KINGMAN 86401	

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July 1
Valle Vista

Name (plea[illegible] clea[illegible]	[illegible]	Phone Number	
George WALKER	Self	1-928 814-3486 cell #	70 [illegible] Reac
Robert Bechtold		909) 362-6322	Po b
Marie Veradt	Self	—	95
Anne Hofling	—	757-3733	282
James E. Dillow	—	(928) 692-5610	7520
Hank L. Wilson	Self	928-757-7282	102
Patrick Abreu	Self	928-692-5992	704
2 Billie O'Dell	Self	928-279-5934	1180
Herberta Schroeder	Self	279-1549	190
Anthony Gaffke	Self	928 767 3009	160
Theresa Plyler Winter	Self	928 692 2049	8752
Jean Van Hook	"	692-1313	9296
Dan Diamond	Self	404 915 1420	
Mike Neal		928-716-4788	681 Kings
Karin Stephan	Self	928-692-6758	732

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HOUSE
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2009
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Mailing Address	How did you hear?
247 SPRINGS, Az. 86434	Local Bullentin Board.
x 8391 Redland CA. 92375	Mailer
le Concho Dr. Kingman, Az	Paper
2 MONTE TESORO DR KINGMAN 86401	PAPER
SUPERSTITION DR. KINGMAN	PAPER
58 N. Mano Kingman	Paper
E. STONEAXE DR KINGMAN	WEB
E cholla TREE KingMAN	
1E. Andy Devine	Paper
9 N. MADal Rd Dolinsana	CARD
N Ironwood Dr. Kingman	Card/paper
Singletree Dr. Kingman	Newspaper
Scottsdale, AZ	Web
E RIO VERDE DR AZ 86401	
Blackjack Dr Kingman 86401	Web

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July 1.
Valle Vista

Name (please print clearly)	Organization	Phone Number	
Leo Horner		928-530-1365	130
Cyndy Schwartz	ASU	480-60[illegible]-7242	915
Susan Jordan	93AGS	928-692-1915	10644
Kent Luken		928-530-8025	8986
Ronnie Wilk		928-681-9054	942
Sandra Fairchild	EPG	702-263-6553	295
Denise Bensusan	~~Arizona~~ NorthWest Watershed Council	928-692-6933 928-727-2933	481
Rick Verdot		928-681-2525	9536
Jack Hommel	NORTHWEST ARIZONA WATERSHED COUNCIL	565-5156 928-897-3488	3275 W
Barbara Sherwood		928 564-2909	PO
Rick Sherwood		✓	
Jim Smith	AGS 93	928 530 3491	1273
Susan Bayer			
Leonard Moschcau	~~AGE 77~~	928 692 4442	8007
Rand Temwilleger	Self	928-757-9414	773

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SOLAR PROJECT
IOUSE
SHEET
2006
ountry Club

Mailing Address	How did you Hear? (R-Radio, N-Newspaper, Ad, Other, O-Other)
Stockton Hill Rd Kingman	Read in Newspaper
E. LaVieve Lane Tempe AZ	Kingman Daily Miner
Blue Dog Rd Kingman	Kingman Miner / AGS
N. CACTUS DR. KINGMAN	DIRECT MAIL
N. Brigade Circle	V.V. website
Sunridge Heights Pkwy Henderson NV	Website
E Calle Bill 86409	PROPAGANDA NOTICE
Dr, Kingman 86401	V.V. WEBSITE
HEADR. GOLDEN VALLEY AZ	NEWSPAPER
BOX 303, MEADVIEW, AZ	NEWSPAPER
✓	✓
Friendship Pass Kingman	RADIO
	Newspaper / Supervisor Meeting
Saddleback DR Kingman AZ	" "
Tall Trees Ct, Kingman 86401	MAILING

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July

Dorw Farrell	DES EA	928753-4333	301
Ellen Love		928-692-6879	93601
Gary Sims		928-727-1012	1448
Brian Gissendanner		928-606-7784	7891
Brenda Bedaw		928-692-8220	9602

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IOUSE
SHEET
, 2009
Country Club

Mailing Address	How did you Hear? (N-Newspaper Story, NA-Newspaper Ad, F-Flyer, M-Mailer, O-Other)
Pine St. Kingman AZ 86401	Newspaper
. Cowbeile Av Kgm. AZ 86401	Newsletter + DAILY MINER
N Becky Rd Dolan Springs	On Line News Paper
E Concho Kingman AZ 86401	
N. MesaVista Az	Mailer.

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HUALAPAI VALLE
OPEN
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July 1
Valle Vista

Name (please print clearly)	[illegible]	Phone Number	
Mark Hawkins	Laron Corp.	928-303-2166	42
2 Gerald & Linda Lynero	RETIRED	928-757-5752	9370
2 Bob & Kris Lathroum	Retired	757-4252	7
RALPH CONSTABLE	RETIRED 93AGS	757-1209	7
CLARICE DAVIS	RETIRED	692 1840	307
NANCY KASTOR	"	564 2650	P
Bob Brady	"	564 2554	
Nancy Moschow	Above All Realty	692-4442	188
Tim Terwilleger		1702 234-4993	7
Roger Howard	VV	928-757-4489	936
Janice Johnson	Mountain Vista	515-851-2013	105
Wayne Wissinger	Eagle Realty	928 530 0340	90
Chris Dam		928 692 4022	7111

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[illegible] SOLAR PROJECT
HOUSE
[illegible] STREET
[illegible], 2009
Country Club

Mailing Address	[illegible] did you Hear? [illegible] Flyer, NA-Newspaper Ad, [illegible] Walk, O-Other)
[illegible]5 Santa Fe Drive, Kingman, Az 86401	Mailer, Newspaper
[illegible] Cove, Kingman, Az 8640[illegible]	
[illegible]747 E OXBOW 86401	Newspaper / mailer
[illegible]04 OLD MISSION DR 86401	E-MAIL
[illegible]3 N. QUAIL NEST 86401	LOCAL
[illegible]. BOX 206 86444	MEADVIEW
[illegible] " 64 "	"
[illegible] Lucille #3, Kingman	News Media
[illegible]2 Drawite Ct Las Vegas, NV 89148	Father
[illegible] Rd. Bagdad Rd, Kgm 86701	LOCAL VVHOA
[illegible]8 N. Mohave Rd, Kgm 86401	friend at church
[illegible]S Cactus Ct Kingman 8640[illegible]	
[illegible]E Brooks St Kingm 86401	News Letter

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HUALAPAI WATER
OFFICE
BLOCK 1
PAY 1
WALLA VEGAS

Jay Dyck		928-564-2636	PO
Sid Cranstun PE	Done Right Engineering	718-1364	407
Doug Coplet	Resident		693
Jay Kulp		692 1158	700
Len Druian	Resident	757-1565	770
Diane Druian	Resident	757-1565	77
Timothy Bauer	Ferguson	702-743 8873	1410
Celeste N Irons			1448
2 [illegible]	Resident	512 5851970	11290
Levi Wiegersma	Resident	692-8220	960
2 Jack & Candace Weidner	Resident	681-2710	27

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SOLAR PROJECT
ROOM
[illegible]
[illegible] 2000
Country Club

Mailing Address	How did you hear? (e.g. Newspaper, Mailing, Word of Mouth, Flyer, Website, Other)
ox 894 Meadview 86444	F
E. Beale Kgman 86401	Newspapers / RRC
E. MANZANITA DR 86401	MAILER
E Cochise Coils	Mailer
Oxbow	
E. Oxbow Dr	NEWSPAPER
Torrance RD. Ft. Mohave 86426	
N BECKY RD DOLAN SPRINGS 86441	MAILER
Sandriver Ranch 86401	Mailer
mesaVista Place Kingman	Mailer
0 Calle Marquez 86409	paper Mailer

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2	Grant Miller	MCA		PD.
	ADRIAN G. CARDOZA		(928) 897-5697	812
	Debra Sixta	—	928 7277653	812
	Louis Cardenas		928 530 1507	649
	CHARLENE ZAKULA		692-6691	756
	Carolyn Bullock		681-0495	792
	KEN WOODS	—	681-1010	10,
	Rick SHERWOOD		928 564-4909	

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SOLAR PROJECT
ADDRESS
STREET
PROS
Country Club

Mailing Address	Purpose of Meeting?
ox 566 Meadview AZ 86444	Signature
HWY RT 66 KINGMAN AZ	
SHR King —	talk
E El Paso Rd Kingman	invited by Greg
E Tuwaqo DR	Paper
Monte Tesoro	Mail
Gordon DR	MINER PAPER
P. Box 303	NOTICE

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HUALAPAI VALLA
GPEC
STEP 1
July 3
Summary M

KNITTEN	AD	6720051	92
2 GREGG + DANIELLE SOSNOSKIE		928 846-9665	P.O.E
Christopher Hentzher		928 715 4102.	P.O.
Jim Ensley		300-291-1765	PO
Sylvia Shaffer	DEVELOPMENT SERVICES MOHAVE COUNTY	757-0953	PO
3 Richard + Diana Anderson	Resident	757-0487	525 K
Penny Estelle	"	623-816-6300	7054 S
Jeanne Garcia	Citizen	928-692-3846	P.O.
Vernon Burt	Green Team	377-3144	1400
Sheila Short	Green team	757 1713	390
Travis Wilk	Green team	[illegible]	7
Jim Kanelos	SVS	565-2453	440.
Dave Eurinas		757 5719	150
Gary Watson	Mohave Co.	715-3499	128
Tyler Thelson	Kingman High	692-0831	391

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SOLAR PROJECT
SHEET

Mailing Address	How did you hear?
15 BROKEN SADDLE	FRIEND
BOX 625 Yucca AZ 86438	Newspaper
Box 494 Dolan Springs 86441	mailing
Box 1603 DOLAN SPS. 86441	Friend
BOX 2100 KINGMAN AZ 86402	WORK
Lomas Rojas ST, Kingman AZ 86401	Newspaper
Antelope Well Ct Kingman 86401	Association
PO Box 236 Yucca 86438	
[illegible] Kingman AZ 86401	My Job:
Schaffer Ave	Job
Cartwright Dr.	Work
Oatman Rd	
APPALOOSA	
Franklin Ct Kingman Az	Work
Raymond ave.	old guy in Red shirt

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HUALAPAI VALLEY
OPEN
SIGN 1
July 1
November 1

Name (please print clearly)	Organization	Phone Number	
Tony Kuc	TRI-STATE SIGN PAINTING	928-715-2574	580
Dianne Riehle	Private	928 715 0175	207
Nate Grimes	Green Team	928-279-0531	3018
Cody Cailbouette	Green team	928-681-0497	3350
2 Stew + Joan Noble		Private	749
Greg Friedman	Desert Dreams, LLC	702-480-6000	64
[illegible]			277
[illegible]	—	565 0333	255
LeRoy Wissinger	Eagle Realty	718-0800	3842
Paul Andres	K.H.S		
Adrian Rosario	K.H.S		
Daniel Friend	K.H.S		

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Kingman River LN	PARKER
MAYA DR Kingman Az	paper
Mallory loop	paper
Harrison St. Apt 221	Hector Marigni
E. cactus wren Kingman	Az 86401 paper
Renglass St. Henderson, NV	89002 mail
5 Pattes ave	86409
Colorado St. Kingm	86401
Schaeffer Kingman	Wayne
	Old guy in R Shirt

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HUALAPAI VALLEY
OPEN
S GEN 1
Group 1
Assignment 8

Name (please print clearly)	Organization	Phone Number	
KARL TAYLOR	MOHAVE COUNTY	(928) 757-0905 (x) 3973	P.O.
GARY LOTT	independent ~~Appraisal~~	928-757 1747	Po B
JAMES ESTELLE	wind mill Ranch	623 810 6300	7059
JANA SELK	citizen	757-9747	37566
SANDRA M. KESSLER	PRIVATE	753-5908	2079
Victor MAZIANI	mohave county Dwe Coyote Stop.	928 727-2654	PO.
Leo HORNER	SRC	928-530-1363	1308
Wayne Erwin	Home owner	928-715-7505	388
Eden Sánchez	RCM	928 718-5700	6750
Janice Strand	AZGFD	928-692-7700	5325
JESUS Rivera			

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SOLAR PROJECTS
HOUSE
STREET
2005
gh School

Mailing Address	Email? Mailing A? Text?
BOX 7000, KINGMAN, AZ 86401-7000	COUNTY
128 Kingman Az. 86402	NS –
5 Antelope well CT Kingman 86401	Friends
MARTINGALE 86401	Newspaper
Wright Dr. Kingman AZ	Newspaper
Box. 583 yucca az	FRIENDS
Stockton Hill R Suit A285	County
Stockton Hill Rd #105-276	County
Mission Blvd, Kingman AZ 86401	Mohave
N. Stockton Hill Rd, Kingman 86401	Mohave
	Cell ~~[illegible]~~ JC/100

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LINDA BIHUNIAK	R. A. I. D	692-7231	411
MIKE BIHUNIAK	R. A. I. D	692-7231	"
Wayne Wissinger	Eagle Realty	5300340	90
J Neckels	BLM	928.3704	2755
Travis Davis	Green Team	753-8093	273
Jordan Benoitis	GREEN TEAM	727 2093	218
Michael Brown	Green Team	565-0314	987
MARK PENA			832
2 Tonya Donna Beaver		530-7325	4100 N
Geoff Settle		510-2316	377
David & Deborah Boye		9287674273	80

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SOLAR PROJECT
[illegible]
[illegible]
[illegible]
gh School

Mailing Address	How did you hear?
Quinney Ave Kingman 86401	O the
" " "	O the
15 Cactus Ct Kingman	
Mission blvd	Mailer
0 N. Alpha St.	teacher
Northfield	work
Canyon Shadows Dr	work
9 DIDIEN PIATA CT. HENDERSON NV 89015	FLYER
Van Nuyford Kingman, AZ 86401	
W. Drifting Shadowlane Kingman	word of mouth
Box 1238 Dolan Spgs AZ	Postcard

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HUALAPAI VALLE
OPPE
SECR E
Jolly
Kingman A

[illegible]	[illegible]	[illegible] Number	
BEN DiGAUDIO	R.A.I.D	757-1660	4
Harley [illegible]	RAID	753-0329	3
Cody Crane	green team	801-9132	37
Nick Trull	green team	692-4379	29
Andy Whitefield	BLM	718-3746	275
Lorraine Collinge	NONE	692-1012	622
Roland Brown	SELF	(928)681-0428	PO B
Matt Pendley	self	[redacted]	

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SOLAR PROJECT
SCALE
High School

MAILING ADDRESS	HOW DID YOU HEAR ABOUT US?
351 PINTO RD	EMAIL
287 DAKOTA ROAD	NEWSPAPER/RADIO
5 willow Rd	Work
75 E. Carwer Ave.	Work
mohave Blvd. Kingman AZ 86401	Work
cactus Wren Pl. Kingman	Mail
PO BOX 6351 KINGMAN, AZ 86402	WORK
	~~[illegible]~~ yard outside

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BILL BARNES	PRUDENTIAL R.E.	928-716-1522	281
Randell Davis	Coyote (Green Team)	681-7662	7.
Blaydes Morrison	Coyote (Green Team)	928-692-2145	4410

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Andy Devine, Kingman 86401	
9 Tomanada Valentine AZ 86437	Flyer
Van Dyke Rd. Kingman, Az 86401	" "

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HUALAPAI VALLE
DEER
SUN
Aug
Boil on Springs

Name (please print clearly)	Organization	Phone Number	
Jim Kanelos	SVS	928 565-2453	440
KEVIN FITZPATRICK	SELF	702 822 0056	P.O.
BONNIE BATES	SELF	928 767 4563	P O
M. Overholt	Self	928-767-4534	P.
Ed Tubbesing	Labor Ready	928-704-9675	833 Bull
WILLIAM HECHT	RETIRED	928-767-4864	1651
Dorothy Huffman	self	928-767-3201	P O B
Sibby BRYHAN	SELF	928-767-3884	Box
MARK SHALLER	SELF	928-530-2211	405
William Pfaus	SELF	928-897-5118	85
Laura Lantz	Self	928-767-9462	1780
Jean Bishop	Constable	928 715-1560	Po

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[illegible] SOLAR PROJECT
[illegible]
[illegible] MEETING
[illegible] 2009
Community [illegible]

Mailing Address	How did you hear? Newspaper Ad Flyer
R Oatman Rd G.V. 86413	E
1713 DOLAN SPRINGS AZ	NEWSPAPER
BOX 577 DOLAN SPRINGS AZ 86441	M
BOX 1795 DOLAN SPRINGS 86441	News letter
Hancock Rd #2 Lake City, AZ 86442	E-mail
Kingman Dr. Dolan Spgs, 86441	MAILER
Box 235 Dolan Springs AZ 86441	Mailer/ Newspaper
18949 N. Ruby Rd. 8441	
41 Hiler Dr Meadview AZ 86444	
SW. 6TH ST. 86441	Flyer
N Oak Dr, Dolan Springs 86441	Flyer in the mail
BOX 29 Kingman	Newspaper

about 8 people did not sign in

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TONY GAFFKE	MBA Dolan	767 3009	160
CARL HUFFMAN	RESIDENT	767 3201	PO
ROBERT HUFFMAN	"	767 3388	PO
JAMES BETTIS	CREATIVE FINANCE	727 2670	Kf
Mercedes Stout			405
C. Ballard	mohave Co	757-0993	P.O.
~~Yvette Kaiser~~ Hall	Resident		PO
FRANK COLACONE	RESIDENT	702-210-2294	150
SUE BAUGHMAN	DS open space	716 3362	P
Bobbi Jenice Taylor	Resident	767-3996	
Mark MANKA	General Contractor	928-715-5132	1602

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SOLAR PROJECT
HOUSE
STREET
DS, 97838
Community Hall

Mailing Address	How did you hear? Newspaper Ad Flyer
49 W. Mabel Rd DS 86441	—
235 D.S.	STANDARD NEWSPAPER
68 DS	FLYER
M Rose Dr	FLYER.
W. Hiller Dr Meadview	Newspaper & V.F.W.
Box 7000 Kng 86402	
Box 1302	
29 Redmont Rd.	Flyer
B 634	Flyer
1N. Pierce Ferry rd PMB 98	word of mouth

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a mohave sun po

HUALAPAI VALLE
DRIVE
SUITE
Kingman
Dolan Springs

Name (please print) Please		Phone Number	
Davie K. Alvira		767-4264	291
Jim & Kate Crowder		928 715 7557	PO
Terry Lanning		530-2421	25
Linelle Finch		530 2512	25
Shirley Collins	self	928 234 1737	P.O
Eleanor Montoya		928 767 4110	P.O
Betty Ford		928-767-3688	P.O.
Victor Shirwin		767 4801	PO E
Curtis + Cynthia Crandal		801-758-4369	Dol
John G. Ford		767-3688	P.O
Doris Fuhlendorf		767-3538	P.O
Anthony Alley		— u —	
Perry Dickerson		767-4617	P.O.
Alan Barkow	self	767-4474	P.O.
D. Smith			PO

valley solar

/er project

[illegible]
[illegible]
[illegible]
[illegible]
Community Hall

[illegible]	[illegible]
P.O Box Dolan Springs AZ	F- Flyer
Box 962 Meadview AZ 86444	
10 Lucy Lane	Flyer
5 [illegible] Lucy Lane AZ 86409	Flyer - newspaper
Box 1713 Dolan Spring	
Box 1876 Dolan Springs	
Box 485 DOLAN SPRINGS AZ.	FLYER
X 565 " " "	
Springs, AZ 86441	
Box 485 DOLAN SPRING 86441	
Box 1441 Dolan Springs 86441	FLYER
— " —	— " —
Box 1402 Dolan Springs	Flyer - News
x 74, D.S.	M
ox 1648, DS AZ 86441	flyer

Appendix C:

Scanned Comment Forms

Hualapai Valley Solar Project
June 30, 2009
Comment Form

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

P.MOORE@NORTHERNAZFIRE.COM
E-mail address

PATRICK MOORE
Name

NORTHERN ARIZONA CONSOLIDATED FIRE
Organization

2440 Butler AVE.
Street Address

928 757-3151
Daytime Phone No. (*optional*)

KINGMAN AZ 86401
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

WHAT ARE YOUR FIRE PROTECTION PLANS & CODE ENFORCEMENT IDEAS? (EMERGENCY SERVICES ETC.)

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
June 30, 2009
Comment Form

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☒ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

CLARICEdus125@Gmail.Com
E-mail address

CLARICE DAVIS
Name

93 AG South
Organization

3073 N. Owen West
Street Address

928 692-1240
Daytime Phone No. *(optional)*

KINGMAN AZ 86401
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

WATER / SALT / OIL
WATER IS the BIG PROBLEM
WHAT SALTS ARE BEING USED / WHERE FROM / HOW MUCH —
WHAT OIL IS BEING USED — WHAT KIND / HOW MUCH

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

I STRONGLY SUGGEST YOU GO DRY Photovoltaic so you ARE NOT USING OUR NATURAL RESOURCES

Thank you for your time and interest in the Hualapai Valley Solar Project.

I HAVE LIVED ON SOLAR/WIND FOR 20 YEARS. IT IS DIFFERENT. BUT CERTAINLY FEASABLE & NO WATER

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

& Jim

KATE CROWDER
Name

E-mail address

Organization

PO BOX 962
Street Address

920/715-7557
Daytime Phone No. (*optional*)

MEADVIEW AZ 86444
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Happy w/ solar - just do it right...

Investigate opportunities for reuse/recycle evaporative salts.

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

happy w/ water & fact that we will recycle as much as possible

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

impact on wildlife in area - just want to know - wild horses, deer, antelope

Opportunities to create sanctuary?

Thank you for your time and interest in the Hualapai Valley Solar Project.

She has seen fleeing to Pierce Ferry Rd....

impact on Stockton Hill Rd itself?

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☑ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

VFORSBERG@LARON.COM
E-mail address

VICTOR K. FORSBERG
Name

LARON INC.
Organization

4255 SANTA FE DR
Street Address

Daytime Phone No. (*optional*)

KINGMAN AZ
City

AZ
State

86401
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

ITS THE BRAIN of EVERY POWER CO - NOT IN MY BACK YARD
TILL THE ROLLING BROWN OUTS START

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

AN ISSUE RAISED WAS HOW MUCH OF THE POWER GENERATED
BY THIS FACILITY WILL STAY IN THE COMMUNITY ?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☒ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

TonyGaffke@frontiernet.net
E-mail address

Anthony Gaffke
Name

MBA Dolan Sp
Organization

16049 N Mabel Rd
Street Address

928 767-3009
Daytime Phone No. (*optional*)

Dolan Springs
City

AZ
State

86441
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Yes See ATTACHED

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

NO

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Yes Comment see ATTACHED

Thank you for your time and interest in the Hualapai Valley Solar Project.

Proposal to Hualapai Valley Solar

As a concerned general area resident, I live in the "Dolan Springs Outback" and I am a local activist for solar power and water re-use, I would like to make the following proposal to your company as part of the C.S.P. process:

First, let congratulate you for moving forward with a renewable energy project in this time of economic uncertainty. It is just what the doctor and Old Mother Earth ordered, plus it's a near perfect fit for our area. When your plant proves to be as successful as myself and others of foresight know it will be, perhaps rural Mohave County and the Kingman area can live up to its potential as Arizona's prime solar location.

Of course a concern to others and myself in this desert area is water. Your future plans to *Pipeline wastewater from Kingman to cool your turbines is a good idea. However pipelines are expensive and can take years to get approval and funding.

Please consider this, not only is the water used to cool your turbines but it is heated in the process, therefore becoming "energy enhanced" a valuable commodity that can be re-used by other business and community interests. Some examples are: heating and air-conditioning, ice production, many types of aquaculture, desert shrimp or bio-diesel, and Agra business like hothouse produce. Also the water thought hot can be condensed in long run condensers and put to re-use or simply returned to the aquifer,

Establishment of a business, public citizen, and government energy trust can accomplish these type measures at a very low cost to you. It only would involve a small strip of your land on the north side of the project being eased to the trust and the rights to the hot water being given to them to resale and recycle or reuse. There is also the potential to reuse the water once it has had is heat energy removed for turbine cooling.

Over time this concept will create jobs and revenue locally and your resource renewably index (RRI) could be nearer 100% and it will raise your (ROI %) also.

Of course, it won't be as simple or as easy as it sounds, often one solution leads to the creation of another problem. However, this concept is possible with current proven technology. It also eliminates wasted energy, reuses water, creates sustainable eco-friendly businesses jobs, plus it reduces depletion of our precious water resources.

Please consider this not so futuristic concept, "Mine our sunshine" be "Benevolent Neighbors" and turn your water with its excess heat over to us for re-use if you don't intend to use it. It's would good for you and our local communities as well.

Thank You, and, please add my name to your contact list.

7-15-2009

Tony Gaffke
16049 N. Mabel Road, Dolan Springs AZ, 86441, (928) 767-3009

*This proposal is intended as an alternative or joint use concept and should in no way slow the permit process or a wastewater pipeline project from the City of Kingman. In fact a two-way pipeline where the hot water is fed to Kingman and cold water returned is also a sustainable use of our precious local resources.

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

Gary Sims
Name

jeepingnevada@hotmail.com
E-mail address

Organization

Street Address

Daytime Phone No. (*optional*)

Dolan Springs
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Priem Power Plant
uses Dry Cooling

Thank you for your time and interest in the Hualapai Valley Solar Project.

Check that out

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

E-mail address

Name

Organization

Street Address

Daytime Phone No. (*optional*)

City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Poor very Poor presentation to public
S/B questions and answers asked by
public at the representatives then everyone
knows whats going on Dont use
Divide & conquire you look ellerative

Thank you for your time and interest in the Hualapai Valley Solar Project.

ACTION ITEM

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

wgerwin@netzero.com
E-mail address

Wayne Erwin
Name

Organization

928-715-7505
Street Address

Daytime Phone No. (*optional*)

City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Jason to Provide

Thank you for your time and interest in the Hualapai Valley Solar Project.

EPS Coord. & Line of Site

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

irazr22@gmail.com
E-mail address

Gordon Benjitis
Name

Green Tean
Organization

2160 Northfield Ave
Street Address

928 727 2013
Daytime Phone No. *(optional)*

Kingman Az 86401
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

I agree of this ~~the~~ power plant solar project.

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

napken24@Hotmail.com
E-mail address

Travis Davis
Name

Green team
Organization

2730 N. Alpha St.
Street Address

(928) 753-8093
Daytime Phone No. (*optional*)

Kingman
City

AZ
State

86401
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

I agree with the solar project.

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☒ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

J_easley52@hotmail.com
E-mail address

Jimmy Easley
Name

Organization

P.O. Box 1603
Street Address

360-241-1765
Daytime Phone No. *(optional)*

Dolan Springs, ~~AZ~~ & AZ. 86441
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

Kenziecandnay@hotmail.com
E-mail address

Nate Grimes
Name

Green Team
Organization

3018 Mallory loop
Street Address

928-279-0531
Daytime Phone No. (*optional*)

Kingman
City

AZ
State

86401
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

I Agree with the power plant. It's a great idea & will be for everyone.

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☒ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

dng/sos@msn.Com
E-mail address

Dani-Lee Sosnoskie
Name

Organization

P.O. Box 625
Street Address

928-846-9005
Daytime Phone No. (*optional*)

Yucca AZ 86438
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Since there always seems to be those skeptics that need to have everything proven feasible — would it be cost effective to build portions of plant at a time therefore showing the water usage to be minimal? Then build another portion etc?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

how many miles of additional lines need to be installed?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Please Keep me informed about upcoming classes & employment. I want to be involved in any position & have many skills that can be used. Such as Material Handling / Logistics / Special Projects

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

DNG505@MSN.COM
E-mail address

GREGG SOSNOSKIE
Name

Organization

P.O. BOX 625
Street Address

Daytime Phone No. *(optional)*

YUCCA AZ 86438
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

NONE GREAT LOCATION

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

NONE

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

WOULD LIKE TO BE ON THE JOB BOARD WAITING LIST UP DATED.

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
July 15 & 16, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

vhoag556@AOL.COM
E-mail address

VICKI HOAG
Name

VALLE VISTA RESIDENT
Organization

7472 SAWMILL DRIVE
Street Address

Daytime Phone No. (*optional*)

KINGMAN AZ 86401-9422
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

WATER USAGE - DEPLETION OF THE ALREADY COMPROMISED AQUIFER - ALSO WHY ONLY 25-30 YEARS? IS THERE A WAY TO PROJECT REPLACEMENT OR UPGRADES TO THE MIRRORS?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

HOW MUCH WILL STAY/BE SOLD TO MOHAVE COUNTY? WILL THIS DRIVE UP OUR PRICES IF YOU SELL TO "HIGHEST BIDDER" - LIKE NEVADA OR CALIFORNIA - WE ARE UNABLE TO COMPETE

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

WE WOULD LIKE A FORMAL Q&A SESSION - WITH YOUR PANEL OF EXPERTS RESPONDING TO THE CITIZEN'S QUESTIONS & CONCERNS. THE PRESENTATION AT THE VV CLUBHOUSE IS UNFAIR & BIASED - WE ARE NOT ALL ABLE TO HEAR EVERYONE'S QUESTIONS

Thank you for your time and interest in the Hualapai Valley Solar Project.

WOULD THIS BE A LONGER PERIOD IF DRY COOLED INSTEAD OF WET COOLED?

SEE BACK

Access Road

Hualapai Valley Solar Project
August 07, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

E-mail address

Name

Organization

Street Address

Daytime Phone No. *(optional)*

City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Access Rd. to make community closer
21st/23rd St. - last street to BLM land
Stockton Hill - over mountain
→ make easier to distance

Thank you for your time and interest in the Hualapai Valley Solar Project.

*Econ. Benefit

Hualapai Valley Solar Project
August 07, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

BECON@FRONTIERNET.NET
E-mail address

JAMES BETTIS
Name

CREATIVE FINANCING
Organization

CELL 925 727-2670

18677 ROGE DR
Street Address

925 767-1446
Daytime Phone No. *(optional)*

DOLAN SPRINGS AZ 86441
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

ARE YOU HIRING LABOR ON OPERATION -

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
August 07, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

ACTION

Please Print

kittyb61@frontiernet.net
E-mail address

Kitty Boylan
Name

Organization

Street Address

Daytime Phone No. (*optional*)

City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Map 6 miles west of Stockton Pierce Ferry

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
August 07, 2009
Open House Comment Form

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☑ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

FSCINC72@GMAIL.COM
E-mail address

FRANK COLACONE
Name

Organization

15129 EDGEMONT RD.
Street Address

702-210-2294
Daytime Phone No. *(optional)*

Dolan Springs AZ 86441
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

YES I LIKE THE PROJECT AND IT'S TECHNOLOGY AND IT'S CAPABILITIES. I DO NOT WANT OUTSOURCED MATERIALS JOBS ETC. THE MANUFACTURING OF MATERIALS SHOULD BE FROM THE U.S. AND MOST OF THE PERMANENT JOBS SHOULD BE FROM THE LOCAL POPU.

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

AS LONG AS IT IS UP TO DATE TECHNOLOGICALLY I GUESS IS MY CONCERN

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

WHEN MAKING A DETERMINATION FOR JOBS, I WOULD LIKE TO BE CONSIDERED.

I HAVE A BACHELOR OF SCIENCE DEGREE IN INDUSTRIAL TECHNOLOGY. ALSO A MINOR IN MANAGEMENT. I READ BLUEPRINTS AND I RUN CREWS IN THE ENTERTAINING AND RIGGING FIELD.

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
August 07, 2009
Open House Comment Form

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

E-mail address

Ignacia Delval Tz
Name

Organization

8878 W Palo Verde DR
Street Address

928 767 3629
Daytime Phone No. (*optional*)

Dolan Spring AZ 86441-8789
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

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August 07, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

WILLIAM R FRAKES	HOME OWNER.
Name	**Organization**
8545 W. 6TH ST ~~DOL SPRINGS~~	928-897-5118
Street Address	**Daytime Phone No.** (*optional*)
DOL. SPRINGS. AZ	86441
City **State**	**Zip Code**

E-mail address

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

INSTRIDED IN EMPLOYMENT EQ. MENT OPPERATOR & WELDER OWN MY OWN WELDING EQIMENT. ALL TYPS OF WELDING

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

KEVIN FITZPATRICK
Name

SELF
Organization

E-mail address

P.O. BOX 1713
Street Address

702 822 0056
Daytime Phone No. *(optional)*

DOLAN SPRINGS AZ 86441
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

I AM ALL FOR IT
I'M A HEAVY LIFT RIGGER. LOOKING FOR WORK

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

ACTION

Hualapai Valley Solar Project
August 07, 2009
Open House Comment Form

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☒ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

(*) SPIRITRANCH@YAHOO.COM
E-mail address

CARL L. HUFFMAN
Name

RESIDENT
Organization

P.O. BOX 235
Street Address

Daytime Phone No. (*optional*)

DOLAN SPRINGS AZ 86441
City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

WHAT VACUMN WILL THE LOW PRESSURE TURBINE EXHAUST TO BE CONDENSED.

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

YOUR PROJECTED WATER USE IS ASTRONOMICAL AND NOT APPROPRIATE FOR THIS AREA. IT SOUNDS LIKE YOU WILL SUCK THE WATER RIGHT OUT FROM UNDER MY WELL.

Thank you for your time and interest in the Hualapai Valley Solar Project.

(*) Land btw 18th & 16th

ACTION

Hualapai Valley Solar Project
August 07, 2009
Open House Comment Form

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

djc462000@Yahoo.com
E-mail address

Dorothy Huffman
Name

Self-Resident
Organization

PO Box 235
Street Address

[redacted]
Daytime Phone No. *(optional)*

Dolan Springs
City

AZ
State

86441
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

How much WATER are you using? WHY? WHAT happens if Local WATER wells START going dry? WHO is Responsible? Are you going To Recycle The WATER?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Are you going To build a pipe Line and Use effluent FROM Kingman WASTE WATER?

Thank you for your time and interest in the Hualapai Valley Solar Project.

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Jobs

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
August 07, 2009
Open House Comment Form

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☒ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

8042-br@laborready.com
E-mail address

ED TUBBESING
Name

LABOR READY
Organization

833 HANCOCK RD #1-2
Street Address

928-704-9675
Daytime Phone No. (*optional*)

BULLHEAD CITY
City

AZ.
State

86442
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

NO

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

NO

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

NO get it started!

Thank you for your time and interest in the Hualapai Valley Solar Project.

Hualapai Valley Solar Project
August 07, 2009
Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

E-mail address: czyoamer@citlink.net

Name: Perry D Wickerd

Organization:

Street Address: 15965 Ironwood Dr

Daytime Phone No. (*optional*):

City: Polar Springs

State: AZ.

Zip Code: 86441

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Insure Local Hishering and Training.

Thank you for your time and interest in the Hualapai Valley Solar Project.

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☒ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

SID@DoneRightEngineering.com
E-mail address

Sid Cranston PE
Name

Done Right Engineering
Organization

407 E. Beale St
Street Address

928-718-1364
Daytime Phone No. (*optional*)

Kingman
City

AZ
State

86401
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

I would welcome the opportunity to assist in the development of this project

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

Open House Comment Form

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☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

E-mail address

Marie M. Veradt
Name

Organization

9536 Concho Dr.
Street Address

Daytime Phone No. (*optional*)

Kingman
City

AZ
State

86401
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

*Do Not Build it!! Water usage is A Great Concern, as well as Aquafier.

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

I understand this is Hualapai land (BLM) + this sacred ground - How much power will be Lin-zoned -

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

How do you plan to get Kingman City "Water" to your site + how will you fill the wells - The water from Pioneda was for homes not a Solar Plant. You should not be using people's water - We're in a 500 yr drought - we know you're friends with Rhoades - Remember Red Lake is a lake -

Thank you for your time and interest in the Hualapai Valley Solar Project.

*Mojave County General plan states the County will only approve power plants using AIR -

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☑ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

none, yet
E-mail address

Alan Burkow
Name

Teacher of Natural Law
Organization

P.O. Box 74
Street Address

(928) 767-4474
Daytime Phone No. (*optional*)

Dolan Springs
City

AZ
State

86441
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Check out the flooding conditions at your proposed location. Is it on Indian land?

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Priority power is for us locals, not "farmed" out to foreign interests

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

I am checking further into the C.C.T. (Coefficient of Performance) capability of your project, and would like as much technical data as you can supply

Thank you for your time and interest in the Hualapai Valley Solar Project.

A.B.

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☐ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

Bartermeister @ yahoo.com
E-mail address

Bob Beckfold
Name

Organization

Street Address

909.794.0041
Daytime Phone No. (*optional*)

City **State** **Zip Code**

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

Concerned About Water Usage

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

NO

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

Thank you for your time and interest in the Hualapai Valley Solar Project.

... the entire community (Contact us if we can help)
God Bless and Good Luck in your ventures

Thank you for your interest in this project. Please complete the appropriate sections of this form to be included on the project mailing list and to provide any comments or questions you would like to have addressed. You may provide your comments by writing them in the space below. Written comments may be submitted to a Hualapai Valley Solar Project representative, or mailed to the address on the back of this sheet. For more information about the project, please go to www.HualapaiValleySolar.com or call toll free at 1-877-487-1437.

☑ Please include my name on the mailing list and keep me informed of the ongoing progress of this project.

Please Print

Carolynbull@aol.com
E-mail address

Carolyn Bullock
Name

Organization

7923 E. Monte Tesoro Dr
Street Address

681 0495
Daytime Phone No. (*optional*)

Kingman
City

AZ
State

86401
Zip Code

Do you have specific suggestions, concerns or questions about the power plant location, operation, and environmental or economic impacts?

There are already high tension lines in the area, so this would be easier to add on or update the current lines. So Mohave County would be an excellant place for this

Do you have specific suggestions, concerns or questions about the transmission line portion of the project?

Put the solar panels in unnoticeable or hidden areas there is plenty of room close to the high tension lines that are well hidden from view.

Do you have other suggestions, questions, comments, or concerns about the project? (continue on back if needed).

As with all projects when there is something in it for the residents then it gets less opositions. Give residents some solar panels for there homes at cost or below get the goverment to give tax breaks if people go solar themselfs Right now the price of solar stops residents. But if you lowered the price for residents and installation reasonable it would be a win-win situation

Thank you for your time and interest in the Hualapai Valley Solar Project.

Kingman will probably become a great retirement place if the residents could go solar themselfs and sell the power back they don't use. it would be more palitable especially fixed incomes and the skyrocketing energy prices. older people wouldent have to worry about high power bills.

EXHIBIT J-2

DOE/EIS-_____

ENVIRONMENTAL IMPACT STATEMENT SCOPING SUMMARY REPORT

HUALAPAI VALLEY SOLAR PROJECT

Prepared for:

U.S. Department of Energy

Western Area Power Administration

615 S. 43rd Avenue

Phoenix, Arizona 85009

Prepared by:

Transcon Environmental

3740 East Southern Avenue, Suite 218

Mesa, Arizona 85206

(480) 807-0095

November 2009

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LIST OF ACRONYMS

AGFD	Arizona Game and Fish Department
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
BLM	Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
DEIS	Draft Environmental Impact Status
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
HVS	Hualapai Valley Solar, LLC
kV	kilovolt
MW	megawatt
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NPS	National Park Service
NRHP	National Register of Historic Places
Project	Hualapai Valley Solar Project
THPO	Tribal Historic Preservation Office
TMDL	Total Maximum Daily Load
USGS	U.S. Geological Survey
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
Western	Western Area Power Administration

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

This scoping summary report was prepared to provide a synopsis of the agency, tribal, and public scoping process that was conducted for the proposed Hualapai Valley Solar Project (Project) in Mohave County, Arizona. Hualapai Valley Solar, LLC (HVS) is a wholly owned subsidiary of Mohave Sun Power, LLC. HVS has applied to the U.S. Department of Energy (DOE), Western Area Power Administration (Western) to interconnect the proposed Project to Western's transmission system.

This report identifies efforts made to notify interested agencies, tribes, organizations, and individuals about the proposed Federal action and to obtain input from those entities regarding alternatives to be evaluated and issues to be addressed in the environmental impact statement (EIS) being prepared by Western. These efforts have been carried out pursuant to the "scoping process," as defined by the Council on Environmental Quality's (CEQ) regulations implementing the National Environmental Policy Act (NEPA).

The public and agency outreach activities were initiated in June 2009 and involved individual meetings with relevant agencies and a series of public meetings, but the Federal scoping process commenced on September 15, 2009 with the publication of a Notice of Intent (NOI) in the Federal Register (Vol 74, No. 177 at page 47245) (Appendix A) and concluded on October 23, 2009.

1.2 Project Description

Hualapai Valley Solar proposes to construct and operate a 340 mega-watt (MW) concentrating solar power plant in Mohave County, Arizona. The site is approximately 27 miles northwest of Kingman, north of U.S. Route 66, west of Antares Road, east of Stockton Road and U.S. Route 93, and south of Red Lake Playa (Figure 1). The general UTM coordinates of the HVS facility, in meters, are 3945755 N, 770146 E, Zone 11S. The facility would be constructed on 4,160 acres private and public land managed by the Bureau of Land Management (BLM) within the Semidesert Grassland vegetative community of the Mohave Desert.

HVS estimates that construction would commence approximately fall 2010 and continue for up to three years. The facility is designed to operate for a minimum of 30 years. The Project includes three primary components described in the NOI and presented at the public scoping meetings:

- 340 MW Solar-powered Generating Facility
- New Substation and 500-kV Transmission Line
- Two Access Roads and Two Construction Storage Areas

1.2.1 Solar Generation Facility

The proposed Project would use concentrating solar power trough technology to capture the sun's heat to make steam, which would power a traditional steam turbine generator. The solar power facility would contain the power block, solar fields, thermal energy storage system, administrative, control, warehouse, workshop buildings, storm water system, water supply and treatment systems, a wastewater system, and other supporting facilities. The proposed facility would require about 2,400 acre-feet of water per year. HVS expects the primary source of water would be the aquifer under the project site. HVS is also exploring an alternative water source from the new Kingman Hilltop wastewater treatment plant, which could supply up to about 1,800 acre-feet of effluent and would require up to 25-35 miles of underground water pipeline, depending on routing.

1.2.2 New Substation and 500-kV Transmission Line

Other project components would include an electrical substation and transmission line. To support delivery of the power generated by the proposed Project, HVS proposes to build a new 500-kilovolt (kV) transmission line to a new substation. The new substation would occupy 10 to 12 acres and would be built, owned, and operated by Western. Two locations are being considered for the substation. The applicant's preferred substation location would be about two miles from solar field, adjacent to the 500-kV Mead – Phoenix Transmission Line. The transmission line's right-of-way to the substation at the Mead – Phoenix Transmission Line location would be about 4.1 miles long and 200 feet wide.

1.2.3 Access Roads and Construction Storage Areas

Two all-weather access roads would be required for the proposed Project. One of the access roads would originate from Stockton Hill Road and extend approximately 3.7 miles east to the solar power facility. The other road would originate from Antares Road and extend approximately two miles to the preferred substation or one mile to the alternative substation.

Two off-site temporary laydown areas would be used during the construction phase of the Project. These areas would total about 640 acres and would be used for storage and assembly of proposed Project components.

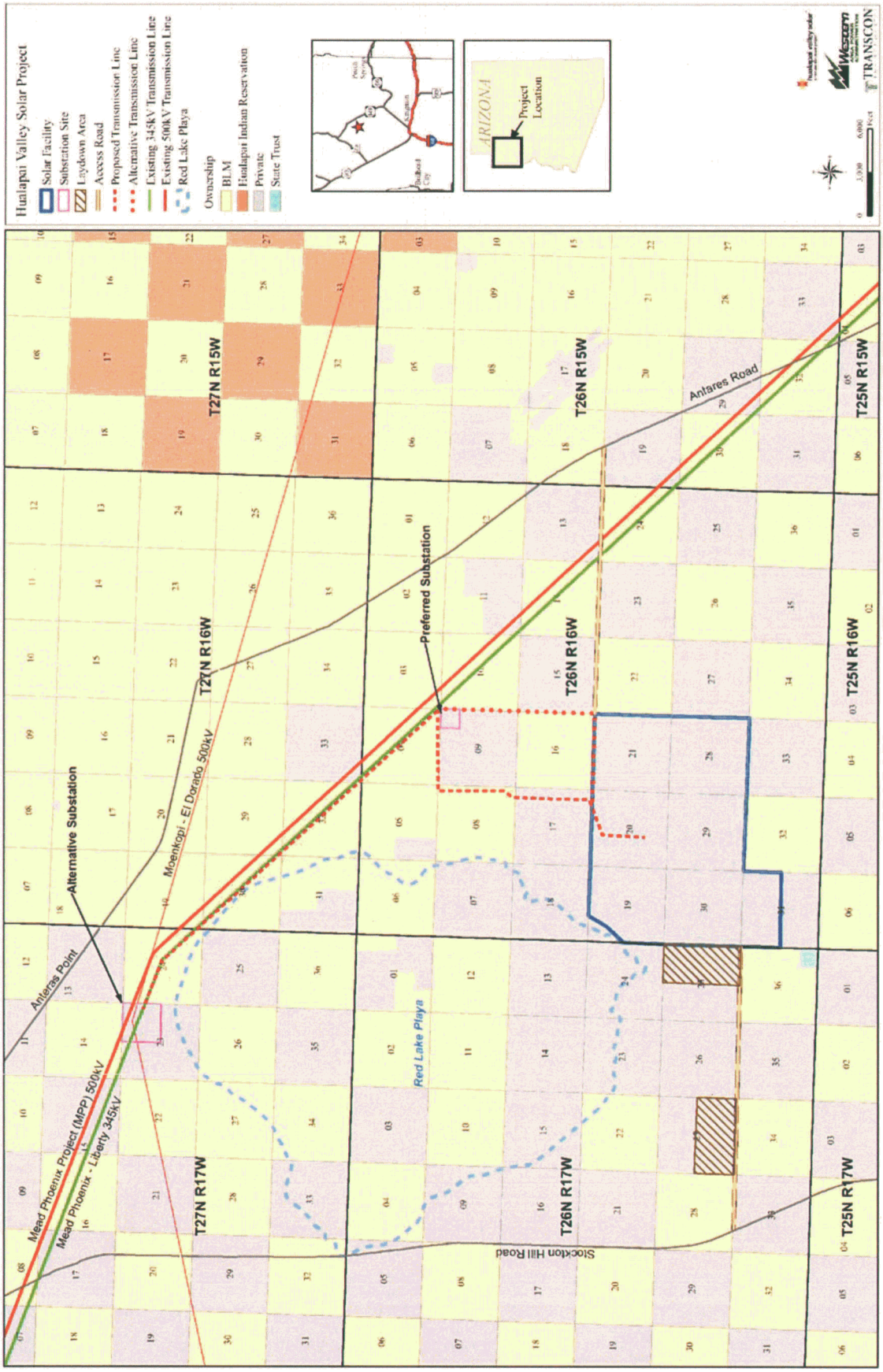

Hualapai Valley Solar Project
Solar Facility
Substation Site
Laydown Area
Access Road
Proposed Transmission Line
Alternative Transmission Line
Existing 345kV Transmission Line
Existing 500kV Transmission Line
Red Lake Playa
Ownership
BLM
Hualapai Indian Reservation
Private
State Trust
ARIZONA
Project Location
Alternative Substation
Preferred Substation
Antares Point
Antares Road
Mead Phoenix Project (MPP) 500kV
Mead Phoenix - Liberty 345kV
Moenkopi - El Dorado 500kV
Red Lake Playa
Stockton Hill Road
T27N R17W
T27N R16W
T27N R15W
T26N R17W
T26N R16W
T26N R15W
T25N R17W
T25N R16W
T25N R15W
TRANSCON

FIGURE 1

1.3 National Environmental Policy Act

NEPA establishes a general framework for evaluating environmental impacts prior to undertaking a Federal action. Western markets federal hydroelectric power to municipalities, cooperatives, irrigation districts, Federal and State agencies, and Native American tribes as prescribed by law. Western owns and operates more than 17,000 miles of high-voltage transmission lines and offers available capacity on its transmission system under Western's Open Access Transmission Service Tariff. HVS filed an application with Western in April 2009 to interconnect its proposed 500-kV transmission line and substation to the Mead – Phoenix Transmission Line. Because the proposed Project would incorporate a major new generation resource into Western's power transmission system, Western determined that an EIS is required under DOE NEPA implementing procedures (10 CFR part 1021, subpart D, Appendix D, class of action D6). Western, as lead federal agency, asked the BLM to become a cooperating agency since access roads and construction storage sites would be located on BLM managed land.

1.4 Purpose of Scoping Process

"Scoping" is an integral part of the NEPA process. Scoping provides "*an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action*" (40 CFR 1501.7). The objectives of scoping for this Federal action include:

- Identify significant issues related to the proposed project.
- Identify environmental, social, and economic review and consultation requirements.
- Define the environmental analysis process and technical studies necessary to adequately address the impacts of the proposed project.
- Identify the interested and affected parties.
- Provide information to agencies and the public regarding the proposed project.

1.5 Organizational Involvement

Roles and responsibilities for the scoping process included:

- Western – EIS lead agency/applicant for transmission line rights-of-way
- BLM – EIS cooperating agency
- HVS – project proponent
- Transcon Environmental – third party contractor

2.0 SCOPING ACTIVITIES

2.1 Notice of Intent

The public was notified of the project and upcoming scoping meetings through the NOI published in the Federal Register on September 15, 2009 (Appendix A). The NOI announced the intent to prepare an EIS and indicated that a public scoping meeting would be held in Kingman, Arizona. The NOI provided specific dates, locations, and times for the scoping meeting. In addition, the NOI provided project information including a description of proposed facilities, project location, information on how to submit comments and why they are important, and Western contact information.

2.2 Scoping Packet

The public, nearby landowners, prior-identified stakeholders, and many tribes and agencies were notified of the scoping period and comment opportunities through a scoping packet distributed by direct mail to nearly 200 people on September 15, 2009 (Appendix A). The scoping packet included a letter of introduction, project flyer, and comment form. The mailing list was developed by the agencies through previous public outreach activities performed for local and state permitting processes (Appendix B). A separate mailing went to 24 potentially interested Native American Tribes in the region. These mailings provided information for submitting comments via mail, fax, and e mail, and included the direct contact information for the Western Project Manager, Mary Barger. The mailing list will be enlarged throughout the Project to include those who provide scoping comments, attend meetings, or express their interest to Western in the Project either through the project website or direct request.

2.3 Project Flyer

The project flyer was posted at 17 locations in Kingman and Golden Valley on September 17, 2009 and eight public areas in Kingman, Dolan Springs, Valle Vista, Hackberry and Peach Springs on September 18, 2009. The flyer included a brief overview of the project, including a schematic map; location, dates, and times of the public scoping meeting; and direct contact information for the Western Project Manager, Mary Barger.

2.4 Newspaper Advertisement

A newspaper advertisement was developed and published in the *Kingman Daily Miner* on Friday, September 18, 2009 and Thursday, September 24, 2009; and *The Standard* on Wednesday, September 16, 2009 (Appendix A). The advertisement included a brief overview of the project, including a schematic map; location, dates, and times of each of the public scoping meetings; URL of the project website; and direct contact information for the Western Project Manager, Mary Barger.

2.5 Radio Announcement

A radio announcement was provided to KGMN and KZKE radio (Appendix A). The announcement provided the location, date, and time for each of the public scoping meetings.

2.6 Press Release

A news release was prepared and released to the media September 16, 2009 (Appendix A). The news release provided a brief overview of the project; announced the locations, dates, and times of each of the public scoping meetings; provided information for submitting comments via mail, fax, and e-mail; introduced the project website; and included the direct contact information for the Western Project Manager, Mary Barger.

2.7 Project Website

A project website was developed and included within Western's web page at http://www.wapa.gov/transmission/HVSolar.htm. The website provided the visitor with a brief project overview; location, dates, and times of the public scoping meeting as well as the NOI; project area map; comment form (print and online); project flyer; news release; and contact information. A copy of the front page of the project website is included in Appendix A.

2.8 Public Scoping Meeting

The public scoping meeting held for the proposed Project was attended by representatives from Western, the BLM, HVS, and Transcon Environmental were present. Thirty-five persons attended the meeting that was organized in open house format so that attendees could come and go at their convenience, as well as speak with project representatives. Question and Comment Cards were distributed and attendees were encouraged to submit questions regarding the Project. The cards were collected and were addressed as part of a discussion period during the meeting. These questions collected at the meeting are included in Appendix C. In addition, a presentation was provided on the proposed project facilities, timeline, estimated costs and benefits, NEPA process, and how to provide comments. Display boards were provided showing maps of the project area and each of the project components, information on the NEPA process, and information on submitting a comment. Comment forms were available for attendees to provide written comments at the time of the meeting or to return by mail. Copies of scoping meeting materials including the presentation, display boards, comment form, project information sheet, and sign-in sheets are provided in Appendix C.

3.0 RESULTS OF SCOPING PROCESS

Comments received during the scoping process included letters, e-mails, electronic comment cards, and phone conversations. A total of 152 specific comments were received from 58 responses. These included individuals, US Environmental Protection Agency (EPA), National Park Service (NPS), Arizona Department of Environmental Quality (ADEQ), Arizona Department of Water Resources (ADWR), Arizona Game and Fish Department (AGFD), and Hualapai Tribal Nation. Comments received were grouped into EIS categories by Western's consultant to aid in incorporating them into the EIS analysis of resources and potential impacts (Table 1). While most comments received identified one or more issues of concern, some comments only requested Project information, and some comments were unrelated to the scoping process. These are discussed in Section 3.3. Comments received are included as Appendix D.

TABLE 1
SUMMARY OF ISSUES RECEIVED DURING SCOPING PROCESS

Main Issue	Total Comments
Project Description	9
Alternatives	8
Mitigation	6
EIS Process	7
Air Quality	9
Biological Resources	16
Cultural and Paleontological Resources	4
Environmental Justice	3
Geology and Soils	4
Land Use	7
Noise	3
Public Health and Safety	1
Socioeconomic Resources	16
Transportation	5
Visual Resources	7
Water Resources	37
Wetlands and Floodplains	1
Cumulative Effects	4
Short-term to Long-term Tradeoffs	5
Total Specific Comments	**152**

3.1 Summary of Issues

The three categories receiving the most comments were water resources (37), biological resources (16), and socioeconomic resources (16). The most commonly expressed opinions for the top three resources are summarized below:

Regarding water resources:

- Scope of the water resources analysis should be broadened to discuss water demands of various solar technologies including wet cooling and dry cooling systems.
- Treated municipal effluent should be evaluated as an alternative water source.
- Project's potential for using more groundwater than is recharged into the aquifer should be considered a significant environmental consequence.

Regarding biological resources:

- Scope of analysis should address the potential to impact wildlife movement and wildlife habitat.
- Analysis should also address the potential for brine ponds to attract and harm or kill wildlife should be evaluated.
- Impact to cienegas and riparian areas from a lowered water table should be considered a significant threshold of environmental impact.

Regarding socioeconomic resources:

- Scope of analysis should include the potential impact on property values.
- Analysis should also discuss whether higher taxes to pay for infrastructure such as roads or pipelines could result.

3.2 Characterization of Issues

This section characterizes comments received during scoping, usually verbatim, in order to give a fuller understanding of the nature of the concern being presented. The comment was included in this summary if it represented a distinctive approach to the issue from prior-listed characterizations. Copies of all original comments are attached in Appendix D.

3.2.1 Project Description

- ADWR recommends the EIS include descriptions of the water supply requirements (including quantity, quality, opportunity for reuse, and disposal) and location of use for all alternatives.
- EPA recommends the draft environmental impact statement (DEIS) statement of purpose and need should discuss the proposed project in the context of the larger energy market that this project would serve; identify potential purchasers of the power produced; and discuss how the project will assist the state in meeting its renewable energy portfolio standards and goals.

- EPA recommends the DEIS should consider how climate change could potentially influence the proposed project…; the DEIS should quantify and disclose the anticipated climate change benefits of solar energy. We suggest quantifying greenhouse gas emissions from different types of generating facilities…and comparing these values.
- EPA recommends that the applicant strive to address the full product life cycle by sourcing parabolic trough components from a company that minimizes environmental impacts during raw material extraction; manufactures parabolic troughs in a zero waste facility; and provides future disassembly for material recovery for reuse and recycling.
- Will energy be directly delivered to Western or stored?
- Is there sufficient capacity on the 345-kV and 500-kV power lines to carry the output of the 340 MW power plant proposed? If not, what type of additional power line will be required to send the power to markets outside of Mohave County?
- Compared to other steam generation plants in the region, how much electricity would this solar plant produce?

3.2.2 Alternatives

- I ask that you do not approve this application unless HVS presents a legally signed contract with the City of Kingman. This contract should include all specifics such as the sale breakdown of [responsibility for] the effluent, pumps and piping.
- While solar energy is the absolute best energy source for meeting federal mandates and state renewable energy portfolio standards, the water consumption required in this full wet cooled power plant is irresponsible to approve when dry cooled or hybrid technology is available to use with minimal energy production loss. All federal agencies including the Hualapai Tribe are required to use Best Available Current Technology…Please reference [the DOE study, Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation], page 5 last paragraph, "Air cooling [dry] and wet/dry hybrid cooling systems offer highly viable alternatives that could reduce the total water usage of steam-generating CSP plants by 80 to 90% at a penalty in electricity cost in the neighborhood of 2 to 10%, depending on plant location and other assumptions." Please require this applicant to use the DOE recommendations in air cooling technology that are part of current water conservation measures.
- EPA recommends the DEIS should describe how each alternative was developed, how it addresses each project objective, and how it would be implemented…
- EPA recommends the DEIS should clearly describe the rationale used to determine whether impacts of an alternative are significant or not. Thresholds of significance should be determined by considering the context and intensity of an action and its effects…

- EPA recommends the DEIS should discuss the feasibility of using residential and wholesale distributed generation, in conjunction with increased energy efficiency, as an alternative to the proposed project.
- The applicant stated to the Mohave County Planning and Zoning Commission on October 17, 2009 that dry cooling nor hybrid cooling technology was not yet available for trough thermal solar generation plants. This is a flat lie. Such technology has been developed, and is in use in Europe, China, and the United States. We the citizens of Mohave County expect the EIS to reflect the true nature of current technology…

3.2.3 Mitigation

- ADWR recognizes the purpose and need for alternative energy development but also recognizes that solar developments will negatively impact wildlife habitat. Project mitigations should focus on the following primary issues related to wildlife and their habitats: wildlife habitat connectivity; depletion of water resources; wildlife impacts resulting from facility development; and project monitoring to evaluate impacts and inform adaptive mitigation solutions. ADWR further recommends mitigating the project through funding research on the effects of solar energy to surrounding wildlife and protecting/purchasing land equivalent to the amount being taken or relocating on unused agricultural lands.
- Best water conservation technology should be identified.
- ADEQ authorizes stormwater discharge permits and reviews the required Stormwater Pollution Prevention Plan for management practices that reduce soil erosion and minimize pollutants' entering waters of the U.S.
- EPA recommends that Western consider adopting a formal adaptive management plan to evaluate and monitor impacted resources and ensure the successful implementation of mitigation measures…
- EIS should require the Project to monitor aquifer and wells around the project, and give limits on [acceptable] well-level drops.
- EIS should require monitoring of flora and fauna listed in Mohave General Plan as endangered, etc. in Project area.
- EIS should require monitoring the electrical, magnetic radiation from 500-kV lines.

3.2.4 EIS Process

- ADWR suggests that Western maintain close coordination with ADWR during development of the EIS.
- I would like to see an extension of time for final filing of comments on the EIS for this project.

- We would ask that a time extension be granted for the scoping final submission date, to allow us time to reasonably calculate the projected [property] financial losses, so that they may be applied to the cost/benefit factors in your scoping process. We suggest an extension of 60+ days.
- It has become clear to us from our local membership, and other concerned citizens that full disclosure of the projected operations/management, equipment, financing, methodology, local environmental, social, and cost/benefit analysis has not been adequately forthcoming from the applicant… We have just now started our own investigations, and ask you to consider a time extension of a minimum of 45 days in order to receive more pertinent data regarding this project.
- The Hualapai Tribe has asked the applicant to participate in a regional area transmission interconnect meeting to consider best benefits for all new planned projects in the area, including and especially renewable projects. We have not heard back from them on this and believe it is significantly important to have this regional collaborative planning to consider joint cost saving and good regional long range energy development planning. We request the meeting for this planning be part of the approval process and be administered by Western with reasonable accountability and benefits marked.
- EPA recommends the DEIS should describe the process and outcome of government-to-government consultation between Western and each of the tribal governments in the project area, issues that were raised (if any), and how those issues were addressed in the selection of the proposed alternative.
- The schedule appears unrealistic, particularly the line siting through the state.

3.2.5 Air Quality

- I live in route to the Red Lake Area. My wells (5 of them) are tested regularly. The TDS count ranges from 960mg/l in wet weather to1590mg/l during drought times. The cooling water will be used in a manner that will cause water droplets to evaporate, the dissolved solids and suspended solids become airborne particulate matter (PM). How will the management of the PM be handled? Will taxpaying citizens be breathing the contaminants and paying for treatments for emphysema, pneumonia, contact allergies, etcetera?
- What controls will be in place to assure the paved roads are kept clean? Will the paving be extended all the way to Stockton Hill Road? The area has running washes both large and small, and they all cause the roads to get covered with dirt when it rains. Traffic across these roads will cause more PM.
- We feel that the proactive steps that HVS has taken to address public concern and protect natural resources, such as using effluent vs. groundwater and biodiesel vs. fossil fuel are reflective of the types of businesses we want in this county.

- NPS is concerned about air quality impacts from construction or service vehicle use.
- EPA has specific recommendations on describing existing conditions; quantifying emissions; specifying emission sources; discuss the need for an equipment emissions mitigation plan and/or a fugitive dust control plan.

3.2.6 Biological Resources

AGFD recommendations for the DEIS:

- The Mohave County General Plan states that "estimated annual water use in Hualapai Valley will be over 14,000 acre-feet per year and exceed natural recharge, placing the aquifer under stress from depletion." As a result, the lowered water table will indirectly affect Arizona's habitats in Hualapai Valley and may have considerable affects on wildlife which depend on small cienegas, springs, seeps, and marshes in the area.
- AGFD is concerned about the use of settling ponds to collect the highly saline wastewater in the evaporative cooling component of the proposed project. These ponds will likely attract birds, bats, and other wildlife which could then be inadvertently poisoned due to concentrated salt and other minerals. Therefore, the Department recommends the ponds be screened to prevent unsuitable and possibly fatal use.
- AGFD is concerned about the possible effects of facility lighting on nocturnal wildlife. Artificial night lighting, which may be intensified by the collection mirrors, may attract insects and the species that prey on the (e.g., bats). It could also impair the ability of nocturnal animals to navigate and may negatively affect reptile populations. The Department recommends using only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, cantered, or cut to ensure that light reaches only areas needing illumination.

EPA recommendations for the DEIS:

- Describe the condition of the land selected for the proposed project and disclose whether the land is classified as disturbed or impaired.
- Indicate what measures will be taken to protect important wildlife habitat areas from potential adverse effects of proposed covered activities and to ensure that desert areas are minimally impacted.
- Discuss impacts associated with constructing fences around the project site(s), and consider whether there are options that could facilitate better protection of covered species.
- Discuss the impacts associated with an increase of shade in the desert environment on vegetation and/or species.

- Discuss potential hazards and impacts to humans and wildlife, especially migratory waterfowl, from evaporation and/or stormwater ponds;
- Include an invasive plant management plan to monitor and control noxious weeds.

Other comments:

- The footprint of this solar plant is absurd. It can and will affect every living thing in this general area. What is the effect on the environment, and what about the heat footprint and what does this heat do to the environment. There will be light pollution as the power plant will be manned 24/7.
- I am concerned about the effects of the brine ponds on flora and fauna, should there be an overflow from the monsoons.
- They say the water coming off the mirrors and such will reenter the aquifer. Before that "reentering" process takes place, the used water will attract snakes, rabbits, lizards, quail, cactus wrens, frogs, turtles, and all other wildlife that can fly over or enter under or through the chain link fencing. Will that water be safe for them to drink?
- How will the pollution [from airborne particulate matter suspended during the evaporation process] affect our bats?
- I am concerned about impacts on protected, threatened, endangered or sensitive species of animals and plants. We have seen bats, the Desert Tortoise, Mohave Green Rattlesnake, Mexican Spotted Owl, and other wildlife, the Silver Pincushion Cactus, Fickeisen Pincushion Cactus in and around the area they plan to bulldoze.
- We are concerned about impacts on migratory birds; we know Albiasa has made no provisions for covering or screening their brine ponds.
- I am concerned about impacts from noxious weeds.
- Will the potential for cheatgrass and other invasive/noxious weeds be addressed?
- Potential effects on Mojave/Sonoran desert tortoises and bighorn sheep should be studied.
- NPS is concerned about destruction of wildlife habitat or interruption of wildlife corridors.
- We are already having some effects of the salt/brine ponds on plants and wildlife in certain areas, contaminating the aqifer and endangering the wildlife, plants, animals and birds.
- Regarding USGS SIR 2007-5182, the section on long-term water-level changes discusses areas in the Detrital, Hualapai and Sacramento Valleys where the groundwater levels have fluctuated over time in response to groundwater recharge or groundwater depletion. The report shows several areas in each of the three basins where water-level rises have occurred during the past several decades as a result of aquifer recharge, as well as other areas where significant water-level declines were observed… The report, however, does not include a computation of the volume of such

groundwater depletions from pumpage or additions from recharge, nor was any comparison made of these changes to the total volume of groundwater available in storage.

- Are there desert tortoises in the project area? If so, impacts should be thoroughly evaluated and minimized.

3.2.7 Cultural and Paleontological Resources

- I am concerned about the impacts on culture or historic resources and tribal values;...we have Indian Reservations in our area and part of my culture over the past 20 years has been to live in a narrow, rural valley, unaffected by modern society.
- The EPA recommends the DEIS should address the existence of Indian sacred sites in the project area...provide a summary of all coordination with Tribes and with the SHPO/THPO, including identification of NRHP eligible sites, and development of a cultural resource management plan.

3.2.8 Environmental Justice

- Socio-economic impacts and disproportionately high and adverse impacts to minority and low-income populations. We are of a fixed low-income and are senior citizens.
- EPA recommends the DEIS should include an evaluation of environmental justice populations within the geographic scope of the project...assessment of the project's impact on minority and low-income populations should reflect coordination with those affected populations.

3.2.9 Geology and Soils

- They are bulldozing 1.400 acres with no natural ground cover...we think the chances are very high of having a [runoff] problem.
- EPA recommends the DEIS should discuss whether the trenching, grading, and filling associated with the construction of this project and the installation of the solar troughs will affect the desert's ability to store carbon, and to what degree this may occur.
- Sierra Club writes that, as seen in the ongoing permitting process for the proposed Ivanpah Solar Energy Generating System in California, development of adequate drainage, erosion, and sediment control plans is a complicated, time consuming, and challenging task. Desert soils are particularly fragile and development can have significant impact on the cryptogrammic crust which is primarily made up of cyanobacteria, mosses, and lichens. When these soils are disturbed, the desert land generates more dust and the area is more susceptible to invasive plant species.

3.2.10 Land Use

- I am in total support of the proposed project. This is the place for it, and although your map in The Standard does not show the lines, there is nothing out [there].

- Since heavy manufacturing with major pollutants is on our east side, west side, south side and now planned for the north side, where is it our leaders want us to live in peace?...Noise, lighting and other residential hazards that we currently enjoy freedom from are of concern to us.
- The residents of this narrow rural agricultural valley (zoned residential/agricultural), strongly object to this valley being changed from its current zoning to MX Heavy Industry zone. We understand that if the current zoning is changed to MX Heavy Indursty all restriction wsill be lifted in this area.
- Whenever possible, new alternative energy facilities should be located near existing transmission lines in already degraded or fragmented areas. Pristine and remote areas should be avoided.
- The EIS scoping process should give strong consideration to the local planning policies established in the 2005 Mohave County General Plan when formulating and evaluating preferred alternatives for the project… The following policies are particularly applicable to consider in the scoping process:
    - *Policy 3.5*--Mohave County will only approve power plants using dry cooling technology when the aquifer is threatened by depletion or subsidence.
    - *Policy 13.8*--Mohave County shall consider proposals for rural industrial uses, if such proposed uses provide significant employment opportunities for County residents, do not require the extension of public urban services, do not require a major source pollution permit from ADEQ; do not mine ground water and are not appropriate for location in a planned industrial area.
    - *Policy 36.12*--Mohave County should pursue and support industries that have smaller environmental footprints as measured by their use of less water and energy resources as well as their creation of fewer emissions when compared to traditional industry.
- How many miles of new transmission lines will be built? How much of that will be on public lands? On private lands?
- How will right-of-way for the pipeline be obtained? Will eminent domain be used?

3.2.11 Noise

- There will be noise pollution with turbines running till midnight or longer.
- Sound should not exceed pre-site existing ambient [noise] at a distance of more than one mile from the project site.

3.2.12 Public Health and Safety

- What about lightning strikes and wildfire?

3.2.13 Socioeconomic Resources

- Is this company getting a tax break? From whom? How much? Are they applying for the government incentive program? Does Mohave County also offer incentives?

- As a tax payer, I don't want to have to pay a cent for a company that will more than likely help deplete the water that helps fill my well.
- How is the effluent water pipeline going to be paid for, is there a bond?
- Another area of concern is property values vs. benefit. The cost vs. benefit covers overlapping issues of land use, land rights, water rights, and use of government funding (state and federal) to accommodate a totally "private enterprise" project.
- Will an impact study be done on real estate values around this Project?
- There is no bond established to protect the Kingman taxpayers from having this [effluent] pipeline cost imposed on them should the Hualapai Valley Solar renege on their part of this project.
- There needs to be a study on how [might] HVS lower property values around this project.
- We are deeply concerned by the property value impact of our clients should this project be approved. On consultation with our real estate advisors, we see a dramatic loss of value from the implementation and construction of this facility.
- This proposed solar plant is a potential customer of ours [Sun West Biofuels]. Our industry will be the first of hopefully many support industries for this solar plant to locate in Mohave County.
- Ten percent of the power generated by the plant should be available for use by Mohave county residents through current utilities.
- A training program should be established to provide a minimum of 75% of the permanent jobs to Mohave county residents. A minimum to 50% of the construction personnel should be county residents.
- The generation demands for electric power at reasonable cost is currently low as demonstrated by the demand response electric sales of the Griffith Energy Plant, also located in Mohave County. Granting the accepted variances in demands and the inability to project future demands, the applicant cannot demonstrate a substantial market for the energy they are proposing to generate nor a cost-sales equation to justify the cost base of their project, even if state and federal subsidies were implemented.

3.2.14 Transportation

- Stockton Hill Road can't handle the traffic. Three deer were killed on that road this past month. I sat for five minutes waiting for John T. Neal's cattle to move off the road. No plans for widening, repairing, fencing or securing a safe road are planned. The area is open range and it is the responsibility of the applicant to fence out, not the rancher to fence in. The infrastructure should be in place and made safe before major manufacturing is allowed in the agricultural/residential areas. Hundreds of semi trucks, used in the construction, will enter Kingman on the I-40/ Stockton Hill exit. They will immediately enter an intersection at Beverly Blvd. that is currently one of the most

congested intersections in the state. True, they can be routed another direction, but Stockton Hill is the shortest route. North of Northern the road is very narrow and very dangerous and probably cannot handle the huge number of semi trucks that this construction will require.

- Regarding U.S. Route 93 at the Hidden Valley exit that I use to access my residence: during construction the heavy equipment, operators, service personnel will definitely be a traffic hazard in the present. In the future we will have the people working at and servicing the heavy industry utility. In the present and in the future we will have noise, air pollution, and un-normally high traffic.
- Will new roads be open to the public or limited to BLM and facility employees?
- Will there be fencing to keep animals from being hit/killed on Stockton Hill Road? Who will be responsible for the required road improvements needed to move trucks and equipment to the site? Who will pay for any repairs caused to bridges or culverts along Stockton Hill Road?

3.2.15 Visual Resources

- 1,400 acres of mirrored troughs, high cooling towers, pipes, lights, traffic, and noise will stick out like a sore thumb in our narrow rural valley.
- I am not in favor of this project being located ¼ mile from my property. I believe it would be a permanent eyesore and detract from any future favorable use and value. I believe the project, if it goes forward, should incur the cost of purchasing all land within a 2-3 mile radius of its boundaries.
- NPS is concerned with degradation of the visual resource including night sky impacts from operational or security lighting.
- Conduct a visual appearance study of the site, to scale, as viewed from Route 66 near the big curve northeast of Valle Vista and furnish a color rendering of the appearance. A similar study should be done from the western subdivision boundary near California and Monte Vista streets with a clear line of site to the proposed facility.
- How will the Project deal with fugitive reflections, especially towards the south and west?

3.2.16 Water Resources

- Water resources should be described based on the geographic area potentially impacted by each alternative. The environmental consequences section should include a description of impacts to water resources of each alternative considered.
- Water is by far the most limiting factor in Arizona and it's needed for human consumptive uses as well as electrical generation. Conversely, electricity poses the problem of limiting water availability. To balance these factors, power plants must generate electricity in the most water efficient manner possible. The technology they are using is not B.A.C.T.! As a matter of fact, this

is truly old and outdated machinery and has been around for many years. Yes, it works, but at whose expense?

- There are many companies that could do dry solar and have almost the same results the wet cooling solar has. One company I came across is called Skyline Solar. They do have a plant in California. It is located in San Jose. In their computer write-up they have stated they recycled materials from the bankruptcy of General Motors. This is a double good project. Green and recycled.
- I'm concerned that Salt/brine pools would contaminate the area and aquifer.
- Our water is a very precious resource… please think long and hard before giving it away.
- Geologists can only give you an educated guess about "how much" water we have. So, meetings turn into dueling experts where you can hire any opinion about how much water there actually is. ...The largest time frame used and spoken of here by regulators etc. is one hundred years and if what I have learned is true, that it takes an ice age to recharge the aquifers, this would seem really short sighted since the time between ice ages is thousands of years…
- I understand the company will use effluent water piped in from Kingman, but there is no binding contract at this time.
- We have proposed to the company representatives that we would support dry cooling and they have flatly denied that proposal.
- There is no metering of water usage.
- They would be using wet instead of dry cooling. Even dry cooling will be antiquated in a few years.
- Are there any current water stable studies that are not instigated by HVS or directly involved with HVS?
- No guarantees are in place assuring the people of Mohave County that the Kingman effluent will be used. All we have seen is a letter of intent. We would like some sort of bonded assurance that this will truly happen before the Plant is permitted.
- As it stands, Albiasa keeps changing the water usage rate. We don't know for sure what the water depletion will be. We do know the water table will be lowered and when the residential wells go dry no one will be responsible or accountable. A large amount of the water they will be using will be turned into steam and vented into our air.
- I am personally opposed to the approval of Hualapai Valley Solar as there is no way to monitor how much water they will be using.
- I am not against solar, I think it's a great idea. What I'm against is the use of our water. HVS does not know exactly how much water they will need to run this generator and until they do and can get it from 100% waste water, I for one would be in favor of sending them back to the drawing board and coming back with an idea that is right for all of us. It's what a good neighbor would do.

- HVS should use dry cooling or hybrid cooling per the Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation Report to Congress by DOE.
- We are concerned of any use of water from our source of supply from Red Lake. Our water table is low already and population is still growing. What would we do if our water source is depleted?
- Would the EIS include the possible pipeline of effluent from the City of Kingman's treatment plant [as an alternative]?
- Being a resident of Dolan Springs and a member of the Community Council, I have great concerns regarding any project that could affect our water supply.
- Mohave County should not welcome any more power plants that depend so heavily on water. Photovoltaics make more sense in this region that cannot keep up with the water supply.
- When you deplete the water source and don't even offer the power generated by that water to those people, where have the people benefitted?
- Will the Project impact the heavy flooding that covers the entire Red Lake area during the Monsoon season?
- ADEQ reviews and authorizes the Aquifer Protection Permits required of wastewater and sewage treatment facilities. The authorization includes design review of such facilities.
- One concern I have is the prudent use of groundwater. I understand that HVS is investigating the use of treated waste water effluent from the City of Kingman to supply a portion of the water used for cooling. This approach or any other water/air cooling system should be fully investigated to ensure that groundwater is used wisely.
- Work conducted [in 1971 and 1986] indicated that under pre-development hydrologic conditions, inflow (i.e., recharge) and outflow to and from the Hualapai Valley was estimated at no more tha 4,000 acre-feet annually. It is also important to note from these studies that outflow of groundwater from the valley is to the north toward Lake Mead NRA. Later reports by Tadayon (2004) and ADWR (2006-08) indicated that by 2005, groundwater withdrawal from the valley was occurring on the order of 8,300 to 9,000 acre-feet annually. Comparison of these inflow and outflow estimates indicate that the water budget for Hualapai Valley is in deficit and that groundwater is being mined at an annual create of approximately 4,300 to 5,000 acre-feet. As currently designed, the proposed wet-cooled solar thermal project would mine an additional 2,400 to 3,000 acre-feet of groundwater from the valley aquifer. This potentially represents a 48% to 70% increase to the current water budget deficit for the alley and a 60% to 75% decrease in the natural outflow of groundwater to the north toward Lake Mead NRA. This condition ears close scrutiny by WAPA and cooperating agencies when scoping and evaluating which solar technology is most appropriate to balancing the

protection of water resources in the valley and advancement of environmentally responsible rural economic development in the County.

- My question is if Mohave County is broke where are the funds coming from to pay for [the effluent pipeline]?
- Mohave County Local Drought Impact Group indicates that drought conditions continue and have significantly worsened since the failure of the monsoon to produce significant rainfall after June 2009...Precipitation amounts reported from various agencies and reporting stations are indicating annual precipitation amounts ranging from one third to two thirds of normal, with 50% of normal being an estimated average. Since much of this rainfall occurred in the first three months of the year and not during the spring or summer, the averages do not adequately reflect [impacts on vegetation].
- Representatives of Lower Colorado River Resource Conservation and Development Council addressed a City of Kingman public meeting on October 28 regarding the sale of effluent to HVS. One concern raised is that the city cannot afford to sell water to HVS without new public financing to construct and maintain an effluent storage tank.
- Water usage will have a detrimental effect of the Hualapai Aqua Fir Basin that is recharging [per USGS] at a rate of only 4,000 acre-feet per year. The requested water allocation for the project is 4,000 acre-feet per year, without consideration of current local residential expansion and projected commercial-industrial demand needs. This is tantamount to water mining, and is a major factor on the environment [because] the Hualapai Basin is currently under drought conditions, creating a potential health and welfare problem for all users of the basin including City of Kingman.
- EPA recommends that the DEIS discuss the water demands of various solar technologies, including wet cooling and dry cooling systems. We also recommend that Western consider utilization of technologies that will minimize water use and the implementation of conservation measures that will reduce water demands.
- EPA recommends that the DEIS should provide information on CWA Section 303(d) impaired waters in the project area, if any, and efforts to develop and revise Total Maximum Daily Loads (TMDLs).
- Can you break down 2400 acre-feet to how many gallons per minute would be used? Is it true that you are planning to drill instead of piping the waste water because of the cost?
- I'm concerned with the validity of the applicant's water report; about the cost and sustainability of the water pipeline; and about water balance.
- How many wells will be drilled?

- When they clean troughs, what acids will they use? Are carcinogens like cadmium, salt, fluoride [part of the] coating?
- How much water would be used to create the steam compared to cooling?

3.2.17 Wetlands and Floodplains

- We live in Meadview, which is 20 road miles from Red Lake and we are well aware of...the heavy flooding that covers the entire Red Lake area experienced during the Monsoon season.

3.2.18 Cumulative Impacts

- The Hualapai Tribe has asked the applicant to participate in a regional area transmission interconnect meeting to consider best benefits for all new planned projects in the area, including and especially renewable projects. Four new projects are proposed in the immediate area including the Hualapai Tribe's proposed 150 MW wind farm. We have not heard back from them on this and believe it is significantly important to have this regional collaborative planning to consider joint cost saving and good regional long range energy development planning.

EPA recommendations for the DEIS:

- Identify whether the proposed project is located within one of the solar energy study areas or is in close proximity to one.
- Consider the cumulative impacts associated with multiple large-scale solar projects proposed in the desert southwest and the potential impacts on various resources including water supply, endangered species, and habitat.
- Describe the reasonably foreseeable future land use and associated impacts that will result from the additional power supply.
- Consider the direct and indirect effects of the inter-connecting transmission line for the proposed project, as well as the cumulative effects associated with the transmission needs of other reasonably foreseeable projects.

3.2.19 Short-term to Long-term Trade-offs

- For what truly few jobs are going to be created, is it worth destroying this whole area for many years to come due to water shortages and no property values as nobody wants to live near this.
- This is not renewable energy; it trades one resource for another.
- Are there green rules and regulations that apply to this project?
- While there are some "not in my backyard" types most of us would like to see solar power. We don't however want them to use our water or leave a legacy of rusting closed plants in our area.

3.3 Comments Outside the Scoping Process

Eighteen comments were received that were judged to fall outside the scoping process that is designed to identify resource issues and potential impacts. They are summarized as follows.

- Twelve exhibits: articles on drought conditions in northwestern Arizona, ecology of washes, and low water use technology for concentrating solar power facilities; CFR Title 40 regulations; EPA website; bills in the Arizona legislature for renewable energy tax districts; and a June 2009 Congressional Research Service Report on water issues of Consentrating Solar Power Electricity in the U.S. Southwest.
- One solicitation for business.
- Two letters written to ADWR and Congressman Trent Franks regarding the Project.
- Three letters to the editor of the Kingman Daily Miner about the proposed Project.

APPENDIX A

ANNOUNCEMENTS

NOTICE OF INTENT

DEPARTMENT OF ENERGY

Western Area Power Administration

Interconnection of the Hualapai Valley Solar Project, Mohave County, AZ

AGENCY: Western Area Power Administration, DOE.

ACTION: Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Meetings; Notice of Floodplain and Wetlands Involvement.

SUMMARY: The Western Area Power Administration (Western), an agency of the DOE, intends to prepare an environmental impact statement (EIS) on the proposed interconnection of the Hualapai Valley Solar Project (Project) in Mohave County, near Kingman, Arizona. Hualapai Valley Solar, LLC (HVS) has applied to Western to interconnect the proposed Project to Western's power transmission system. Western is issuing this notice to inform the public and interested parties about Western's intent to prepare an EIS, conduct a public scoping process, and invite the public to comment on the scope, proposed action, alternatives, and other issues to be addressed in the EIS.

This EIS will address Western's Federal action of interconnecting the proposed Project to Western's transmission system and making any necessary modification to Western facilities to accommodate the interconnection. The EIS will also review the potential environmental impacts of HVS constructing, operating, and maintaining a 340 megawatt (MW) solar-powered generating facility, consisting of a solar field, power block, thermal energy storage system, substation site, transmission line, temporary laydown areas, and other ancillary facilities.

DATES: The public scoping period begins with the publication of this notice and closes on October 23, 2009. A public scoping meeting will be held on October 1, 2009.

ADDRESSES: A public scoping meeting will be held at the Kingman High School Auditorium, 4182 Bank Street, Kingman, AZ 86409. Written comments on the scope of the EIS should be addressed to Ms. Mary Barger, National Environmental Policy Act (NEPA) Document Manager, Western Area Power Administration, Desert Southwest Region, P.O. Box 6457, 615 S. 43rd Avenue, Phoenix, AZ 85005 or *HVSolarEIS@wapa.gov*.

FOR FURTHER INFORMATION CONTACT: Ms. Mary Barger, NEPA Document Manager, Western Area Power Administration, Desert Southwest Region, P.O. Box 6457, 615 S. 43rd Avenue, Phoenix, AZ 85005, telephone (602) 605–2524, fax (602) 605–2630, or e-mail *HVSolarEIS@wapa.gov*. For general information on DOE's NEPA review procedures or status of a NEPA review, contact Ms. Carol M. Borgstrom, Director of NEPA Policy and Compliance, GC–20, U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585, telephone (202) 586–4600 or (800) 472–2756.

SUPPLEMENTARY INFORMATION: Western, an agency within DOE, markets Federal hydroelectric power to preference customers, as specified by law. These customers include municipalities, cooperatives, irrigation districts, Federal and State agencies, and Native American tribes. Western's service territory covers 15 western states, including Arizona. Western owns and operates more than 17,000 miles of high-voltage transmission lines.

HVS, a wholly owned subsidiary of Mohave Sun Power LLC, has applied to Western to interconnect the proposed Project to Western's transmission system. The interconnection would be facilitated with a new substation, built, owned, and operated by Western, located at one of two alternative locations: (1) The Mead-Phoenix Transmission Line; or (2) the Liberty-Mead Transmission Line. The Mead-Phoenix Transmission Line is owned by 14 participants, including Western. The Liberty-Mead Transmission Line is owned by Western. Western offers capacity to deliver electricity on its transmission system, when such capacity is available, under Western's Open Access Transmission Service Tariff.

HVS also has applied to the U.S. Department of the Interior, Bureau of Land Management (BLM) for rights-of-way to build, operate, and maintain a portion of the proposed transmission line and access roads on public lands managed by the BLM, Kingman Field Office. In order for Western to build interconnection facilities on BLM lands, Western must apply to the BLM to amend its right-of-way.

Additionally, the proposed Project is subject to State and local approvals prior to Project construction. These approvals include the following: A Certificate of Environmental Compatibility from the Arizona Corporate Commission, an Air Quality Permit for the Arizona Department of Environmental Quality, an Aquifer Protection Permit from the Arizona Department of Environmental Quality, and a General Plan amendment from Mohave County.

Project Description and Alternatives

HVS proposes to construct a 340–MW, solar-powered electrical generation facility in Mohave County, Arizona. The solar power facility would occupy about 4,160 acres. The proposed Project would be located about 27 miles north of Kingman, and 20 miles east of U.S. Highway 93. It would be constructed on BLM and private lands within the Semidesert Grassland vegetative community of the Mohave Desert.

The proposed Project would use concentrating solar power trough technology to capture the sun's heat to make steam, which would power a traditional steam turbine generator. The proposed Project would require about 2,400 acre feet of water per year. HVS expects the primary source of water would be the aquifer under the project site. HVS is also exploring an alternative water source from the new Kingman Hilltop wastewater treatment plant, which could supply up to about 1,800 acre feet of effluent and would require about 25–35 miles of underground water pipeline, depending on routing. The solar power facility would contain the power block, solar fields, thermal energy storage system, administrative, control, warehouse, and workshop buildings, storm water system, water supply and treatment systems, a wastewater system, and other supporting facilities.

Other Project components would include an electrical substation, a transmission line, and two access roads. To support delivery of the power generated by the proposed Project, HVS proposes to build a new 500-kilovolt (kV) transmission line to a new substation. The new substation would be built, owned, and operated by Western. Two locations are being considered for the substation. The applicant's preferred substation location would be about 2 miles from the solar field, adjacent to the 500-kV Mead-Phoenix Transmission Line. The alternative location is about 6 miles further north at the intersection of the Mead-Phoenix, Liberty-Mead, and Moenkopi-Eldorado transmission lines, with interconnection to the Liberty-Mead 345-kV Transmission Line. The substation would occupy about 10 to 12 acres. The length of the transmission line to the preferred substation location at the Mead-Phoenix Transmission Line location would be about 4.1 miles. The length of the transmission line to the alternative substation location at the Liberty-Mead Transmission Line location would be about 9.6 miles. The

transmission line right-of-way would be 200 feet wide.

Two access roads would be required for the proposed Project. One of the access roads would originate from Stockton Hill Road and extend approximately 3.7 miles east to the solar power facility. The other road would originate from Antares Road and extend approximately 2 miles to the preferred substation or 1 mile to the alternative substation.

Two off-site temporary laydown areas would be used during the construction phase of the Project. The laydown areas would total about 640 acres and would be used for storage and assembly of proposed Project components.

Agencies Proposed Actions and Alternatives

Western's proposed actions are to build a new substation and interconnect the proposed Project to Western's transmission system at one of the substation locations described above. BLM's proposed actions are to grant rights-of-way to HVS for the transmission line and associated access roads and any other Project components crossing Federal lands and to amend one of Western's existing rights-of-way to build a substation at one of the substation locations described above.

Western and BLM will also consider the no-action alternative in the EIS. Under the no-action alternative, Western would neither build a new substation nor interconnect the proposed Project and/or the BLM would not grant or amend rights-of-way.

Agency Responsibilities

Because interconnection of the proposed Project would incorporate a major new generation resource into Western's power transmission system, Western has determined that an EIS is required under DOE NEPA implementing procedures, 10 CFR part 1021, Subpart D, Appendix D, class of action D6.[1] Western would be the lead Federal agency for preparing the EIS, as defined at 40 CFR 1501.5. The proposed Project includes construction of facilities on lands managed by the BLM; therefore, the BLM has agreed to be a cooperating agency for preparation of the EIS. Western invites other Federal, State, local, and tribal agencies with jurisdiction by law or special expertise with respect to environmental issues to be cooperating agencies on the EIS, as defined at 40 CFR 1501.6. Such agencies may also make a request to Western to be a cooperating agency by contacting Ms. Barger at the address listed above in the **ADDRESSES** section.

The proposed Project may affect floodplains or wetlands. This notice also serves as notice of proposed floodplain or wetland action, in accordance with 10 CFR part 1022.

Environmental Issues

This notice is to inform agencies and the public of Western's intent to prepare an EIS and solicit comments and suggestions for consideration in the EIS. To help the public frame its comments, the following list contains potential environmental issues preliminarily identified for analysis in the EIS:

1. Impacts on protected, threatened, endangered, or sensitive species of animals or plants;
2. impacts on migratory birds;
3. impacts from noxious weeds, invasive and non-native species;
4. impacts on recreation and transportation;
5. impacts on land use, wilderness, farmlands, and Areas of Critical Environmental Concern;
6. impacts on cultural or historic resources and tribal values;
7. impacts on human health and safety;
8. impacts on air, soil, and water resources (including air quality and surface water impacts);
9. visual impacts;
10. socio-economic impacts and disproportionately high and adverse impacts to minority and low-income populations.

This list is not intended to be all-inclusive or to imply any predetermination of impacts. Western invites interested parties to suggest specific issues within these general categories, or other issues not included above, to be considered in the EIS.

Public Participation

The EIS process includes a public scoping period; public review and hearings on the draft EIS; publication of a final EIS; and publication of a record of decision (ROD). The public scoping period begins with publication of this notice and closes October 23, 2009. At the conclusion of the NEPA process, Western and the BLM would each prepare a ROD. Persons interested in receiving future notices, Project information, copies of the EIS, and other information on the NEPA review process should contact Ms. Barger at the address listed above in the **ADDRESSES** section.

Western will hold a public scoping meeting on October 1, 2009, at the Kingman High School Auditorium, 4182 Bank Street, Kingman, AZ 86409. The meeting is scheduled for 6–8 p.m. with a short presentation followed by an open-house meeting, during which attendees are invited to speak one-on-one with agency and Project representatives. Attendees are welcome to come and go at their convenience throughout the meeting.

The purpose of the scoping meeting is to provide information about the proposed Project, review Project maps, answer questions, and take written comments from interested parties. All meeting locations are handicapped-accessible. Anyone needing special accommodations should contact Ms. Barger to make arrangements.

The public will have the opportunity to provide written comments at the public scoping meetings. Written comments may also be sent to Ms. Barger by fax, U.S. Postal Service mail, or e-mail. To help define the scope of the EIS, comments should be received by Western no later than October 23, 2009. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Dated: September 9, 2009.

Timothy J. Meeks,

Administrator.

[FR Doc. E9–22201 Filed 9–14–09; 8:45 am]

BILLING CODE 6450–01–P

[1] On October 4, 1999, DOE's Assistant Secretary for Environmental, Safety and Health delegated to Western's Administrator the authority to approve EISs for integrating transmission facilities with Western's transmission grid.

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. PR09–32–000]

DCP Raptor Pipeline, LLC; Notice of Petition for Rate Approval

September 4, 2009.

Take notice that on September 1, 2009, DCP Raptor Pipeline, LLC (Raptor) filed a petition for rate approval for NGPA Section 311 maximum transportation rates, pursuant to section 284.123(b)(2) of the Commission's regulations. Raptor requests that the Commission approve a maximum firm reservation charge of $2.342 per MMBtu per month, firm commodity charge of $0.0000 per MMBtu, maximum interruptible transportation charge of

DIRECT MAIL PACKET

HUALAPAI VALLEY SOLAR PROJECT

Western Area Power Administration (Western), an agency of the U.S. Department of Energy, and the U.S. Department of the Interior, Bureau of Land Management (BLM) are preparing an environmental impact statement (EIS) for the Hualapai Valley Solar Project (Project) in Mohave County, near Kingman, Arizona. The EIS will address interconnecting the proposed Project to Western's electrical transmission system, a right-of-way grant by the BLM for proposed facilities on Federal land, and an analysis of potential environmental impacts of the proposal by Hualapai Valley Solar LLC to construct, operate, and maintain a 340-megawatt (MW) solar-powered generating facility.

The Project would include construction and operation of a 4,160-acre solar power facility. Other project components include an electrical substation, a 500-kilovolt (kV) transmission line, and two access roads. The proposed Project would be located approximately 27 miles north of Kingman and 20 miles east of US 93.

We need your ideas

We would like to know of any issues, concerns, and suggestions you may have. Your comments will help define issues and alternatives for consideration during the environmental review process. Comments can be provided in person at a public meeting to be hosted by Western, by mail, e-mail, or telephone via the contact information below.

Website: www.wapa.gov/transmission/HVSolar.htm
E-mail: HVSolar@wapa.gov
Project phone: (602) 605-2524
Project fax: (602) 605-2630

Mail: Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Scoping meeting scheduled

Western will host a public scoping meeting to allow the public and interested parties an opportunity to learn about the Project and the National Environmental Policy Act (NEPA) process, ask questions, and provide comments about issues to be addressed in the EIS. The meeting will be held at the following date, time, and location.

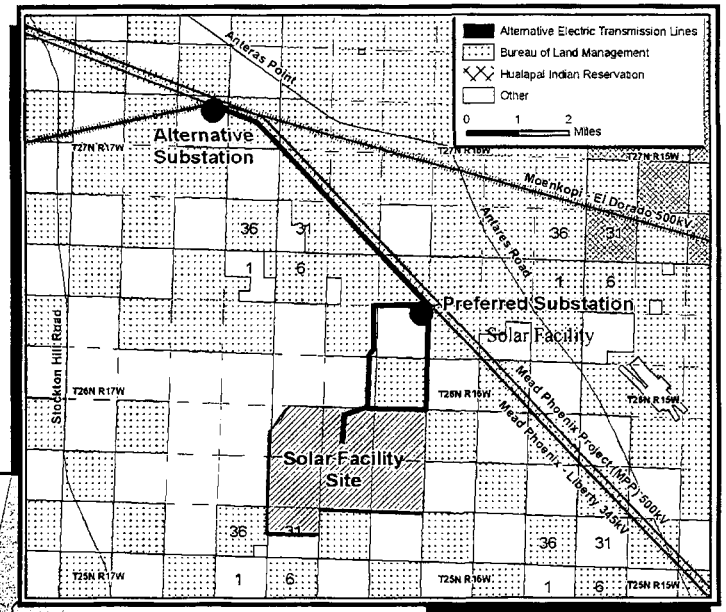
Thursday, October 1, 2009, 6:00-8:00 pm
Kingman High School Auditorium
4182 Bank Street, Kingman, Arizona 86409

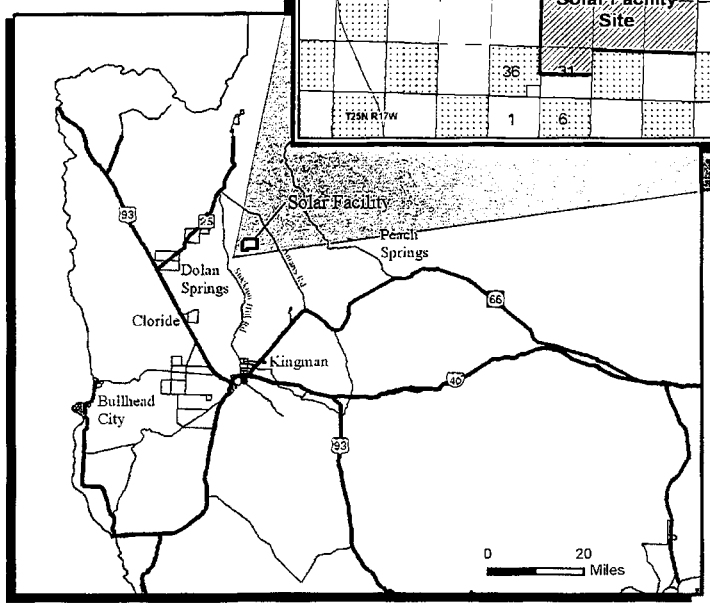
A pre-addressed and stamped comment form is enclosed for your convenience. To ensure consideration as we develop the EIS, Western should receive your comments by October 23, 2009. Additional project information is available on the project website. We look forward to receiving your comments.

Western
AREA POWER
ADMINISTRATION

HUALAPAI VALLEY SOLAR PROJECT

WE WELCOME YOUR COMMENTS





Kingman High School Auditorium
4182 Bank Street, Kingman, Arizona 86409
Thursday, October 1, 6-8 pm

Western Area Power Administration (Western) will host a public scoping meeting October 1, 2009 to share information about the proposed Hualapai Valley Solar Project. Learn about the National Environmental Policy Act (NEPA) process, meet project team members, ask questions, and provide comments at the meeting.

Hualapai Valley Solar LLC proposes to build a 340-MW solar power facility approximately 27 miles north of Kingman and 20 miles east of US 93. The solar power facility would be located on private land. A new transmission tie-line and access roads are proposed across Federal land, managed by the Bureau of Land Management.

Your comments will help define issues and alternatives for evaluation in the environmental impact statement Western is preparing for the proposed project. The public scoping comment period closes **October 23, 2009**.

For more information or to provide comments visit the project website at:

www.wapa.gov/transmission/hvs.htm

or contact

Ms. Mary Barger
Western Area Power Administration
PO Box 6457
Phoenix, AZ 85005
Telephone (602) 605-2524
Fax (602) 605-2630
Email HVSolar@wapa.gov

Western
AREA POWER
ADMINISTRATION

HUALAPAI VALLEY SOLAR PROJECT

WE WELCOME YOUR COMMENTS

Your comments will help Western Area Power Administration define issues and alternatives for the proposed project. Please provide your comments in the space below, fold on the recommended lines, tape closed, and affix the proper postage. Please provide comments by **October 23, 2009**.

Mail comments to:
Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Last Name: First Name:

Organization (if applicable) :

Mailing Address:

City, State, Zip:

E-mail Address (optional):

Comments:

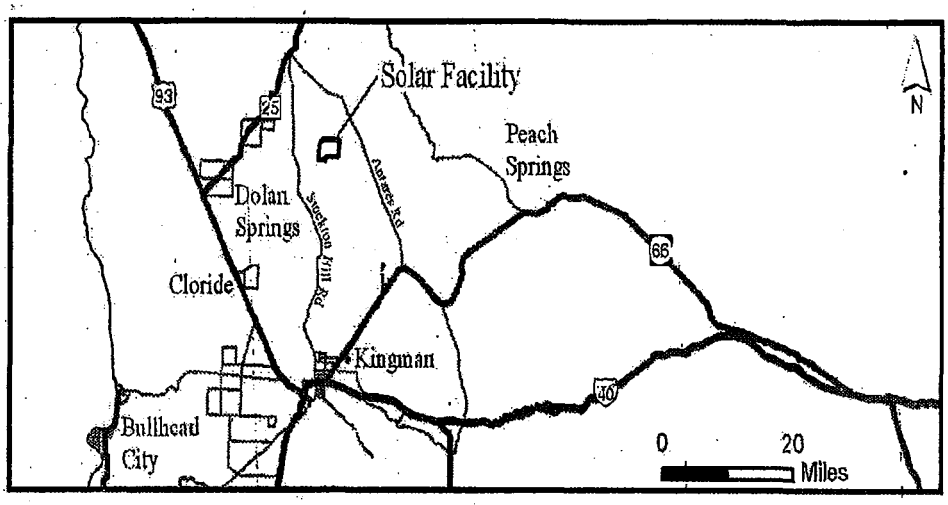
Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☐Yes ☐No Please send me information by e-mail (*provide email address*)

NEWSPAPER AND RADIO ANNOUNCEMENTS

HUALAPAI VALLEY SOLAR PROJECT
PUBLIC SCOPING MEETING

Thursday, October 1, 6-8pm



Kingman High School Auditorium
4182 Bank Street, Kingman, Arizona 86409

Western Area Power Administration (Western) will host a public scoping meeting October 1, 2009, to share information about the proposed Hualapai Valley Solar Project. Learn about the National Environmental Policy Act (NEPA) process, meet project team members, ask questions, and provide comments at the meeting.

Hualapai Valley Solar LLC proposes to build a 340-MW solar power facility approximately 27 miles north of Kingman and 20 miles east of US 93. The solar power facility would be located on private land. A new transmission tie-line and access roads are proposed across Federal land, managed by the Bureau of Land Management.

Your comments will help define issues and alternatives for evaluation in the environmental impact statement Western is preparing for the proposed project. The public scoping comment period closes **October 23, 2009.**

For more information or to provide comments visit the project website at:
www.wapa.gov/transmission/hvs.htm
or contact
Ms. Mary Barger
Western Area Power Administration
PO Box 6457, Phoenix, AZ 85005
telephone 602-605-2524, fax 602-605-2630
email HVSolar@wapa.gov

Western
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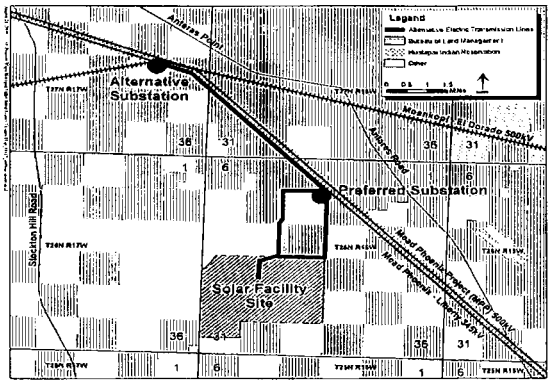
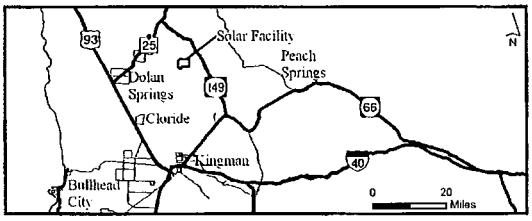


HUALAPAI VALLEY SOLAR PROJECT
PUBLIC SCOPING MEETING

Thursday, October 1, 6-8pm



Kingman High School Auditorium
4182 Bank Street, Kingman, Arizona 86409

Western Area Power Administration (Western) will host a public scoping meeting October 1, 2009 to share information about the proposed Hualapai Valley Solar Project. Learn about the National Environmental Policy Act (NEPA) process, meet project team members, ask questions, and provide comments at the meeting.

Hualapai Valley Solar, Inc. proposes to build a 340 MW solar power facility approximately 27 miles north of Kingman and 20 miles east of US 93. The solar power facility would be located on private land. A new transmission tie-line and access roads are proposed across Federal land, managed by the Bureau of Land Management.

Western is an agency of the U.S. Department of Energy and has the responsibility to prepare an environmental impact statement. The Bureau of Land Management will be a cooperating agency. Your comments will help define issues and alternatives for evaluation in the environmental impact statement. The public scoping comment period closes **(Insert Date)**.

For more information visit the project website at:
www.wapa.gov/transmission/hvs.htm
or contact
Ms. Mary Barger
Western Area Power Administration
PO Box 6457, Phoenix, AZ 85005
telephone 602-605-2524, fax 602-605-2630
email HVSolar@wapa.gov

Western
AREA POWER
ADMINISTRATION

From: Western Area Power Administration
Contact: Randy Wilkerson, 720-962-7056, Wilkerson@wapa.gov
For use: Sept. 26 – Oct. 1
Length: 1:00

NEPA SCOPING MEETING SET FOR HUALAPAI VALLEY SOLAR PROJECT

AN OPEN-HOUSE PUBLIC SCOPING MEETING WILL BE HELD THURSDAY, OCTOBER 1, FROM 6 TO 8 P.M., IN THE AUDITORIUM OF THE KINGMAN HIGH SCHOOL ON BANK STREET. WESTERN AREA POWER ADMINISTRATION WILL SHARE INFORMATION AND ANSWER QUESTIONS ON A PROPOSED PROJECT TO DEVELOP A 340-MEGAWATT SOLAR-POWERED GENERATING FACILITY IN MOHAVE COUNTY, NEAR KINGMAN, FOR WHICH WESTERN IS PREPARING AN ENVIRONMENTAL IMPACT STATEMENT .

FOLLOWING A BRIEF PRESENTATION, YOU ARE INVITED TO VISIT WITH PROJECT STAFF AND PROVIDE WRITTEN COMMENTS. WESTERN SHOULD RECEIVE YOUR WRITTEN COMMENTS BY OCTOBER 23.

FOR MORE INFORMATION, VISIT THE PROJECT WEB SITE AT WWW.WAPA.GOV/TRANSMISSION/HVSOLAR.HTM.

PRESS RELEASE

(View in HTML)

NEWS FROM WESTERN AREA POWER ADMINISTRATION

FOR IMMEDIATE RELEASE: September 16, 2009
CONTACT: Randy Wilkerson, 720-962-7056, wilkerson@wapa.gov

PUBLIC OPEN-HOUSE SCOPING MEETING SET FOR HUALAPAI VALLEY SOLAR PROJECT

Public invited to provide comments during environmental review phase

LAKEWOOD, Colo. —An open-house public meeting will be held Thursday, Oct. 1, in Kingman, Ariz., from 6 p.m. to 8 p.m.at the Kingman High School Auditorium, 4182 Bank Street, Kingman, Ariz. 86409 on the proposed Hualapai Valley Solar Project.

The Hualapai Valley Solar Project involves the construction and operation of a 4,160-acre solar power facility. Other project components include an electrical substation, a 500-kilovolt (kV) transmission line, and two access roads. The Hualapai Valley Solar Project would be located approximately 27 miles north of Kingman and 20 miles east of US 93.

The open-house meeting is part of Western Area Power Administration's effort to share information and receive public comments on the scope of issues it will evaluate in the Hualapai Valley Solar Project Environmental Impact Statement. Western, an agency of the U.S. Department of Energy, is preparing an EIS because the proposed project would interconnect with Western's electric transmission system. The EIS will be prepared according to the National Environmental Policy Act (NEPA). The Bureau of Land Management will be a cooperating agency.

Western invites the public to provide written comments on the scope of the EIS, including resources to be evaluated, alternatives to be considered, and significant concerns and issues. Comments on the scope of the EIS may be provided at the scoping meeting or sent to Western at the following address: email to HVSolar@wapa.gov, fax to (602) 605-2630, or mail to Ms. Mary Barger, NEPA Document Manager, Western Area Power Administration, P.O. Box 6457, Phoenix, AZ 85005. Comments may also be provided online at http://www.wapa.gov/transmission/HVSolar.htm.

To be most valuable in preparing the EIS, Western should receive written comments by the end of the scoping comment period, October 23, 2009. For further information about the environmental process, please call (602) 605-2524 or visit: www.wapa.gov/transmission/HVSolar.htm.

-30-

Western Area Power Administration annually markets and transmits more than 10,000 megawatts of clean, renewable power from hydroelectric powerplants owned and operated by the Bureau of Reclamation and the U.S. Army Corps of Engineers in 15 western and central states. It is part of the Department of Energy.

PO Box 281213 Lakewood , CO 80228-2802 · Phone: 720-962-7050 · Toll Free: 1-800-982-4523
Fax: 720-962-7059 · E-mail: CorpComm@wapa.gov· Web site: http://www.wapa.gov

Serving the West with Federal hydropower

Western
AREA POWER
ADMINISTRATION

WEBSITE INFORMATION

Hualapai Valley Solar Project

Hualapai Valley Solar, LLC, a wholly-owned subsidiary of Mohave Sun Power, LLC, proposes to construct, operate and maintain a 340-megawatt, solar-powered generating facility in Mohave County, near Kingman, Ariz. The proposed project would use concentrating solar-power-trough technology to capture the sun's heat to make steam, which would power a traditional steam turbine generator. Proposed infrastructure would consist of a solar field, power block, thermal energy storage system, substation site, transmission line, temporary laydown areas and other ancillary facilities.

Western will prepare an environmental impact statement to address Hualapai Valley Solar's request to interconnect the proposed project to Western's transmission system and any necessary modifications to Western facilitites to accommodate the interconnection. The EIS will also review the potential environmental impacts of constructing, operating and maintaining the proposed project.

The proposed project would interconnect with Western's transmission system at one of two alternative locations, either the 500-kV Mead-Phoenix Transmission Line or the 345-kV Liberty-Mead Transmission Line.

Open-house public scoping meeting scheduled

Western will host an open-house public scoping meeting **Thursday, Oct. 1, from 6 to 8 p.m., at the Kingman High School, 4182 Bank St., Kingman, Ariz. 86409** to share information and answer questions about the proposed project. Following a brief presentation, you will have an opportunity to visit with project staff to ask questions and provide written comments.

Your comments will help us define the issues to be addressed in the environmental impact statement. You are invited to suggest specific issues and concerns that should be evaluated in the EIS. Western should receive your comments by Oct. 23. You may comment online or send written comments by fax, e-mail or U.S. Postal mail to

Ms. Mary Barger
NEPA Document Manager

Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
615 S. 43rd Avenue
Phoenix, AZ 85005
Fax: 602-605-2630
E-mail: HVSolarEIS@wapa.gov

Scoping materials

Comment form - mail-in (18 kb pdf)
Comment form - online
Local direct-mail announcement (23 kb pdf)
Scoping meeting flyer (1.2 MB pdf)
Scoping meeting new release - Sept. 16, 2009
Project area map (95 kb pdf)

Project updates

Notice of intent to prepare an environmental impact statement (46 kb pdf)
EIS determination

Contact information

Ms. Mary Barger
NEPA Document Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
615 S. 43rd Avenue
Phoenix, AZ 85005
Voice: 602-605-2524
Fax: 602-605-2630
E-mail: HVSolarEIS@wapa.gov

hualapai valley solar

project status

Hualapai Valley Solar LLC (HVS) proposes to construct a 340MW concentrating solar power plant in Mohave County, Arizona, over 27 miles north of Kingman and 100 miles south of Las Vegas on approximately 4,000 acres of private land. The HVS Project will use a proven parabolic trough technology that has been operational in the United States since the 1980s.

Key Stakeholder Meeting

Hampton Inn
1791 Sycamore Ave, Kingman
06.30.09 | 11:00-1:00 PM

Open House Public Meeting

Valle Vista Country Club
9686 N. Concho Drive, Kingman
07.15.09 | 5:00-7:00 PM

Open House Public Meeting

Kingman High School
4182 Bank Street, Kingman
07.16.09 | 5:00-7:00 PM

More

- HVS Fact Sheet June 26 2009
- HVS Mohave County Citizens Participation Plan
- HVS General Plan Amendment
- HVS Area Plan

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Contact Us Privacy Policy

APPENDIX B

MAILING LISTS

AGENCY, INTERESTED PARTIES, AND PROPERTY OWNERS

DISTRIBUTED 193 LETTERS ON 09/15/09
Mailing included:

Project newsletter (cover letter)
Comment form (front and back)
Information Flyer (printed on blue paper)

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AUG 04 2009

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SUBJECT: Hualapai Valley Solar LLC plans to construct a 340 megawatt (MW) concentrating solar power (CSP) facility within Mohave County, Arizona.

Dear Ms. McCoy:

Western Area Power Administration (Western), a power-marketing agency of the Department of Energy, has received a request from Hualapai Valley Solar LLC plans to construct a 340 megawatt (MW) concentrating solar power (CSP) facility within Mohave County, Arizona and interconnect with Western's transmission system in the State of Arizona. Part of this project will be located on the Bureau of Land Management's (Kingman Field Office) lands so they will be a cooperating agency for the purposes of the National Environmental Policy Act (NEPA).

The purpose of this letter is to inform you of this proposed project, provide notice that Western and BLM will prepare an Environmental Impact Statement (EIS) for the proposed project, initiate Government-to-Government consultation, and invite your participation in the NEPA environmental review and National Historic Preservation Act (NHPA) Section 106 consultation process. Western and BLM would also like to propose a Tribal consultation meeting and site visit for August 27 or 28, 2009 starting 10:00 am at the BLM Kingman office. Project description and updates will be provided during which time Western and BLM would like to your input, comments and insight concerning the proposed project.

The information presented in this letter includes a brief project description and map. Since this is the early planning stages of the proposed project, additional information will continue to be provided to you and your designated tribal departments or staff as it becomes available. The Project is located approximately 27 miles north of Kingman, and 20 miles east of U.S. Highway 93 (U.S. 93). The HVS Project is comprised of the Project Site, access roads, substation site, and a transmission line, each of which is described below.

Project Site

The Project Site is comprised of 4,160 acres of private land and includes all lands within sections 20, 21, 28, 29, 30, the north half of section 31, and all but the northwest corner of 19, all within Township 26 North, Range 16 West, Gila and Salt River Baseline and Meridian. The Project Site would contain the power block, solar fields, thermal energy storage system, technical and non-technical buildings, storm water system, water supply and treatment systems, and a wastewater system, as well as other ancillary supporting facilities.

Project Area

The Project Area includes the Project Site and associated facilities including access roads, substation site, transmission line, and laydown areas.

Access roads: Two new roads would provide access to the Project Site; one from Stockton Hill Road and a second from Antares Road. Stockton Hill Road access would originate at the intersection of Stockton Hill Road and the section line between sections 28 and 33, Township 26 North, Range 17 West and extend east approximately 3.7 miles to the Project Site. Antares Road access would originate at the intersection of Antares Road and the section line between sections 18 and 19, Township 26 North, Range 15 West and extend west approximately 3.5 miles to the Project Site.

Substation site: Two substation sites are under evaluation for the transmission line interconnection point. The locations being evaluated for the substation site are the northeast quarter of the northeast quarter of section 9, Township 26 North, Range 16 West (Preferred Substation), and the northeast quarter of section 23, Township 27 North, Range 17 West (Alternative Substation). Only one substation site would be used for the HVS Project.

Transmission line: A new transmission line would connect the Project Site with the regional transmission grid via interconnection with either the 500-kilovolt (kV) Mead – Phoenix Transmission Line or the 345-kV Liberty – Mead Transmission Line. The length of the transmission line would depend on the location of the HVS Project Substation. *If the substation site located in section 23, Township 27 North, Range 17 West is selected; then, the transmission line would be approximately 9.6 miles in length. If the substation site located in section 9, Township 26 North, Range 16 West is selected; then, the transmission line would be approximately 4.1 miles in length.* The transmission line would export power generated by the HVS Project to consumers.

Laydown Areas: The HVS Project would require two temporary laydown areas during the construction phase of the project. The laydown areas would be used for storage and assembly of HVS Project components. These laydown areas would be located within the east half of section 25 and the south half of section 27, all within Township 26 North, Range 17 West.

Cultural resource work for this project has not been initiated. Western would like to have your input and if you desire participation during the cultural resource work. Please feel free to contact any of the contacts listed below concerning the proposed August 27 or 28 consultation meeting (please indicate which date you would prefer) and the cultural resource schedule and participation

We understand that the lands affected by this project may be part of the traditional homelands of various tribes and may contain places and resources that have special cultural or historical significance to members of various tribal communities. Because of these traditional cultural properties (TCPs), Western would like the tribal government to become participants in the study process

For questions related to the project please contact Western staff, Mary Barger at 602-605-2524; barger@wapa.gov or Steve Tromly, 720-962-7256; tromly@wapa.gov or BLM staff, Craig Johnson at 928-718-3731; craig_j_johnson@blm.gov. This letter will be followed by a telephone call to consulted tribes to confirm the consultation meeting concerning this proposed project.

You may address any comments, regarding the project to either of the individuals below.

Mr. Steve Tromly
Native American Liaison
U.S. Department of Energy
Western Area Power Administration
P.O. Box 281213
Lakewood, CO 80228-8213
--or--
12155 West Alameda Parkway
Lakewood, CO 80228
(720) 962-7256 phone
(720) 962-7269 fax
tromly@wapa.gov

Ms. Mary Barger
Environmental Planner
U.S. Department of Energy
Western Area Power Administration
P.O. Box 6457
Phoenix, AZ 85005-6457
--or--
615 South 43rd Avenue
Phoenix, AZ 85009
(602) 605-2524 phone
(602) 605-2630 fax
barger@wapa.gov

We look forward to hearing from you.

Sincerely,

John R. Holt
Environmental Manager

Enclosures

Mr. Charles F. Wood, Chairman
Chemehuevi Indian Tribe
P.O. Box 1976
Havasu Lake, CA 92363

Ms. Kara McCoy
NAGPRA Committee
Chemehuevi Indian Tribe
P.O. Box 1976
Havasu Lake, CA 92363

Mr. Eldred Enas, Chairman
Colorado River Indian Tribe
26600 Mohave Road, Route 1 Box 23-B
Parker, AZ 85344

Mr. Michael Tsosie, Director Museum
Colorado River Indian Tribes
26600 Mohave Road, Route 1 Box 23-B
Parker, AZ 85344

Mr. Timothy Williams, Chairman
Fort Mojave Indian Tribe
500 Merriman Avenue
Needles, CA 92363

Ms. Linda Otero, Director
Aha Makav Cultural Society
Fort Mojave Indian Tribe
10225 South Harbor Avenue, Unit 7
Mohave Valley, AZ 86440

Mr. Don Watahomigie, Chairperson
Havasupai Tribe
10 Main St
Supai, AZ 86435

Mr. ~~Ronald~~ Manakaja
Natural Resources Dept.
Havasupai Tribe
10 Main St
Supai, AZ 86435

Mr. Chairman
Ms. Mary Felter, Assistant Tribal Secretary
The Hopi Tribe
123 Main Street
Kykotsmovi, AZ 86039

Mr. Leigh Kuwanwisiwma
Director Cultural Preservation
The Hopi Tribe
123 Main Street
Kykotsmovi, AZ 86039

Mr. Wilfred Whatoname Sr.
Chairperson Hualapai Tribe
941 Hualapai Way
Peach Springs, AZ 86434

Ms. Loretta Jackson-Kelly
Tribal Historic Preservation Officer
Hualapai Tribe
878 West Route 66
Peach Springs, AZ 86434

Mr. Thomas Beauty,Chairman
Yavapai-Apache Nation
2400 West Datsi Street
Camp Verde, AZ 86322

Mr. Vincent Randall
Apache Cultural Program Director
Yavapai-Apache Nation
2400 West Datsi Street
Camp Verde, AZ 86322

Chris Coder, Tribal Archaeologist
Yavapai-Apache Nation
2400 West Datsi Street
Camp Verde, AZ 86322

Mr. Ernest Jones Sr., President
Yavapai-Prescott Indian Tribe
530 East Merritt Street
Prescott, AZ 86301-2038

Mr. Greg Glassco, Director
Cultural Resource Program
Yavapai-Prescott Indian Tribe
530 East Merritt Street
Prescott, AZ 86301-2038

Mr. Scott Kwiatkowski
Tribal Archaeologist
Yavapai-Prescott Indian Tribe
530 E. Merritt
Prescott, AZ 86301

Ms. Deanna Domingo, Chairwoman
Moapa Paiutes Cultural Committee
1 Lincoln Street
Moapa, NV 89028

Mr. Richard Arnold
Cultural Tribal Chairman
Pahrump Paiute Tribe
Las Vegas Indian Center
2300 West Bonanza Road
Las Vegas, NV 89106

Mr. Kenny Anderson
Cultural Resource Coordinator
Las Vegas Paiute Indian Tribe
One Paiute Drive
Las Vegas, NV 89106

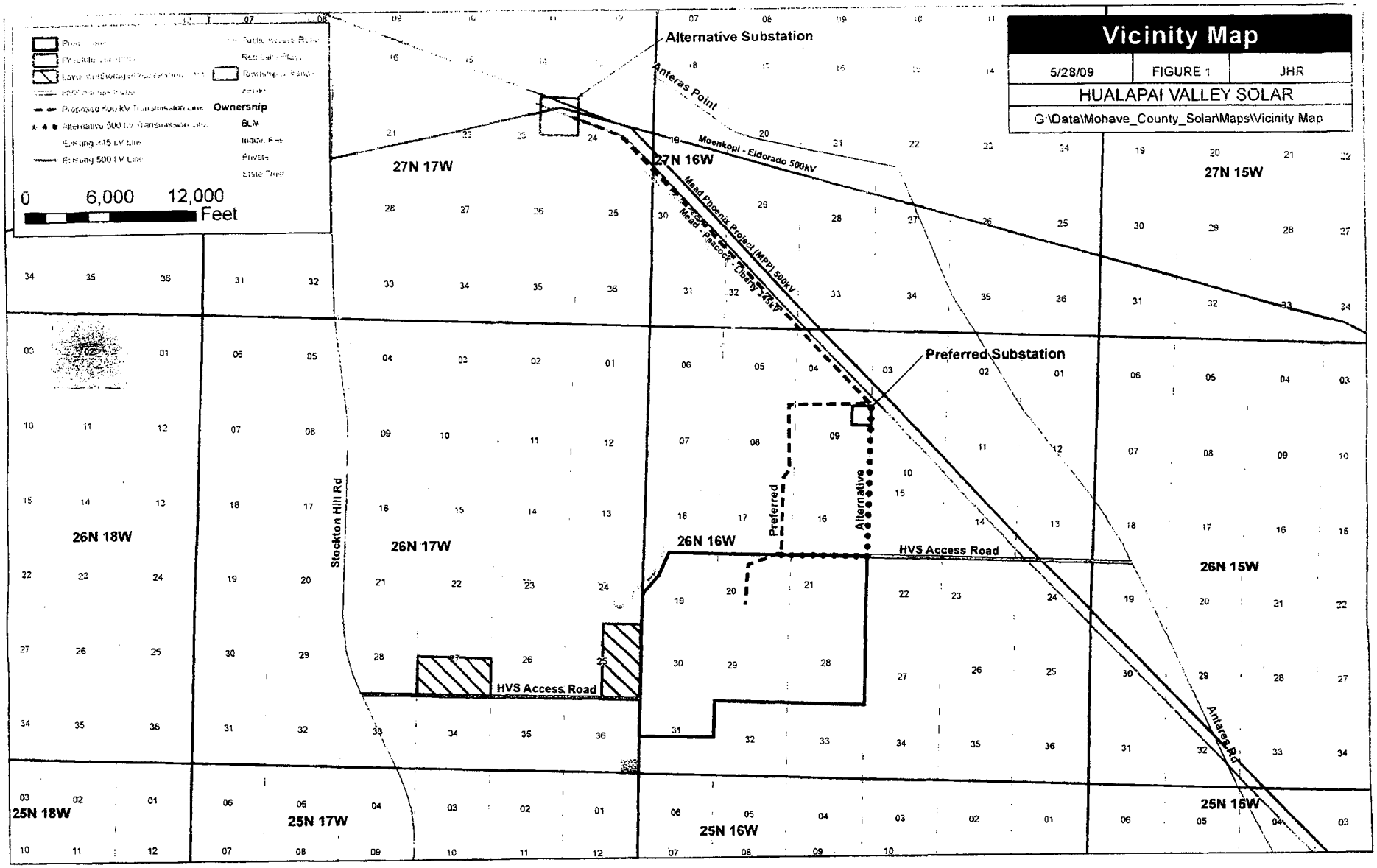
Ms. Monica Van Ansdale
Yavapai Cultural Program Director
Yavapai-Apache Nation
2400 West Datsi Street
Camp Verde, AZ 86322

Mr. Craig Johnson
Bureau of Land Management
Kingman Field Office
2755 Mission Boulevard
Kingman, AZ 86401

Dec
S Tromly, A7400, Lakewood, CO
C Cunningham, A7400, Lakewood, CO

Barger (G0430)
Rhoades (G5636)
Cristelli (G5605)
Holt (G0400)

FILE: 5440.04 Hualapai Valley Solar Project


Vicinity Map
5/28/09
FIGURE 1
JHR
HUALAPAI VALLEY SOLAR
G:\Data\Mohave_County_Solar\Maps\Vicinity Map
Alternative Substation
Preferred Substation
Anteras Point
Moenkopi - Eldorado 500kV
Mead Phoenix Project (MPP) 500kV
Mead - Peacock - Liberty 345kV
Antares Rd
Stockton Hill Rd
Preferred
Alternative
HVS Access Road
HVS Access Road
27N 17W
27N 16W
27N 15W
26N 18W
26N 17W
26N 16W
26N 15W
25N 18W
25N 17W
25N 16W
25N 15W
Ownership
BLM
Indian Res
Private
State Trust
0
6,000
12,000
Feet

APPENDIX C

PUBLIC SCOPING MEETINGS

SLIDE PRESENTATION

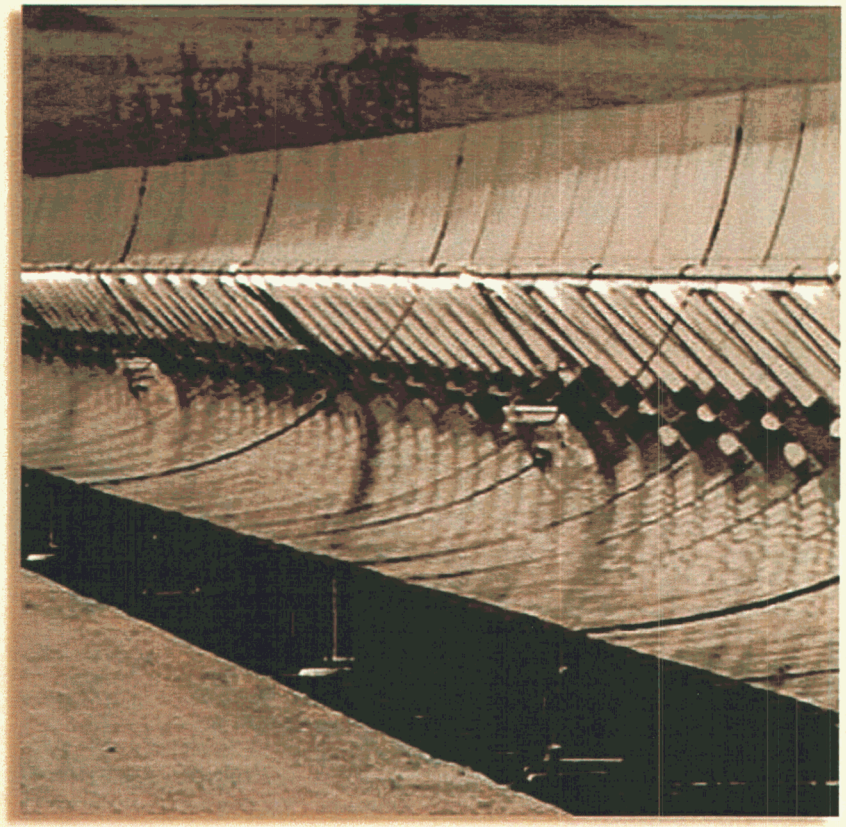
Western
AREA POWER
ADMINISTRATION

HUALAPAI VALLEY SOLAR PROJECT

NEPA PUBLIC SCOPING MEETING

WELCOME

HUALAPAI VALLEY SOLAR PROJECT



INTRODUCTIONS

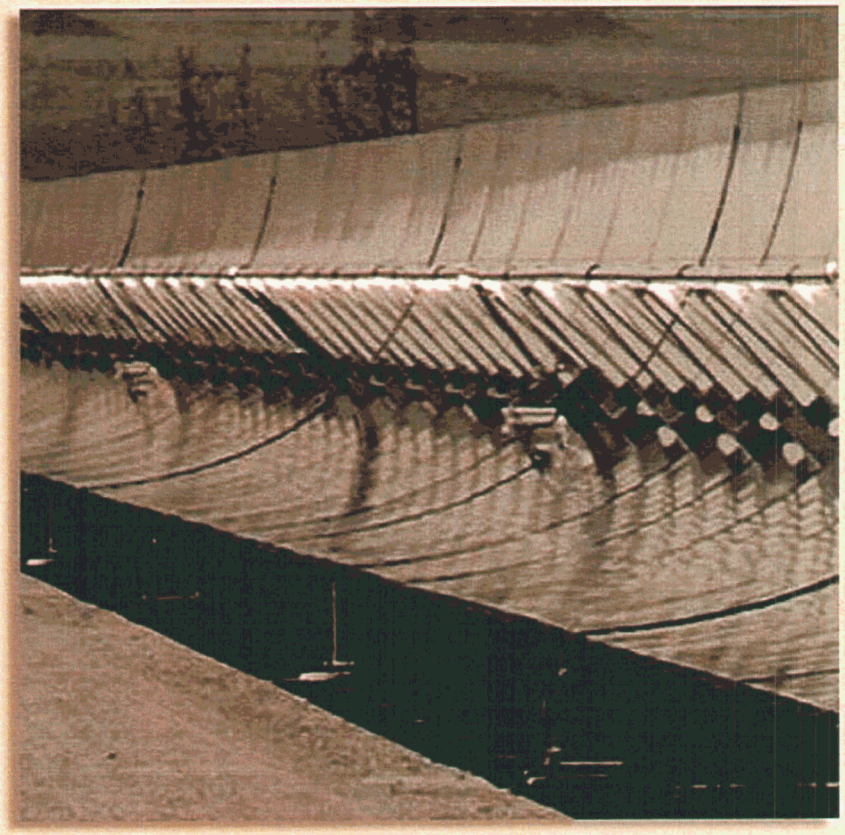
PROJECT OVERVIEW

NEPA PROCESS

QUESTIONS/COMMENTS

Western
AREA POWER
ADMINISTRATION

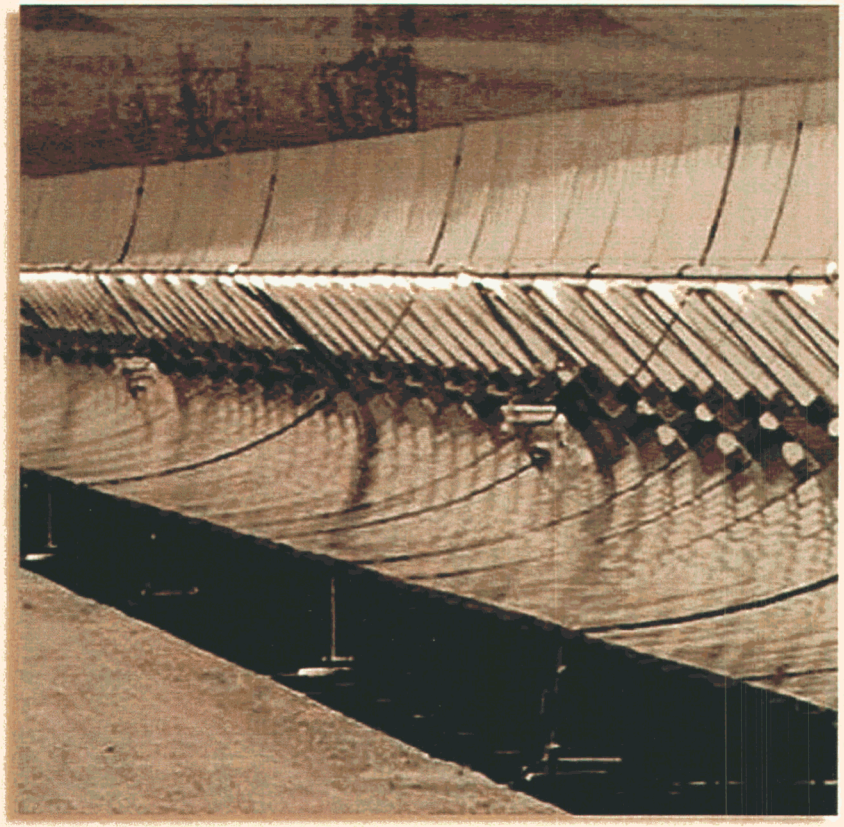
INTRODUCTIONS



- **Federal Agencies**
  - Western Area Power Administration- Lead Federal Agency
  - Bureau of Land Management- Cooperating Agency
- **Applicant**
  - Hualapai Valley Solar LLC

Western
AREA POWER
ADMINISTRATION

HUALAPAI VALLEY SOLAR PROJECT



PROJECT OVERVIEW

Western
AREA POWER
ADMINISTRATION

PROJECT OVERVIEW

MOHAVE SUN POWER LLC

- A development company
- Mission: to develop, construct, own and operate utility-scale solar power projects
- Principals have previously developed energy and renewable energy projects
- Hualapai Valley Solar LLC, a wholly owned subsidiary, is a single-purpose company

PROJECT OVERVIEW

MOHAVE SUN POWER LLC

Purpose

- Construct utility-scale solar project
  - Proven technology
  - Store energy
- Maximize use of private land
- Help meet renewable energy standards set by Arizona, Nevada, and California
- Interconnect to a transmission system with available capacity and broad service area
- Implement incentives for renewable energy under the stimulus package

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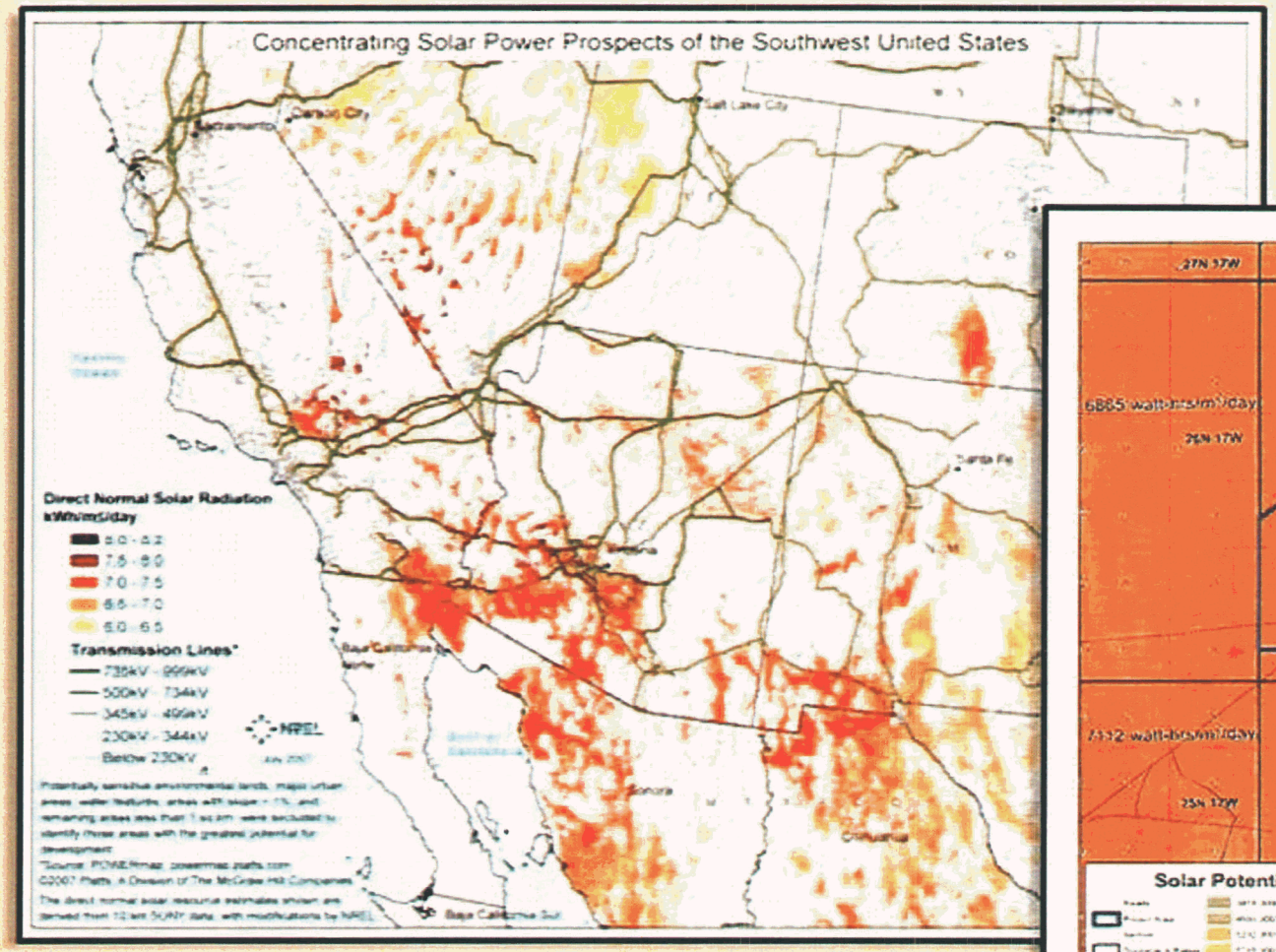
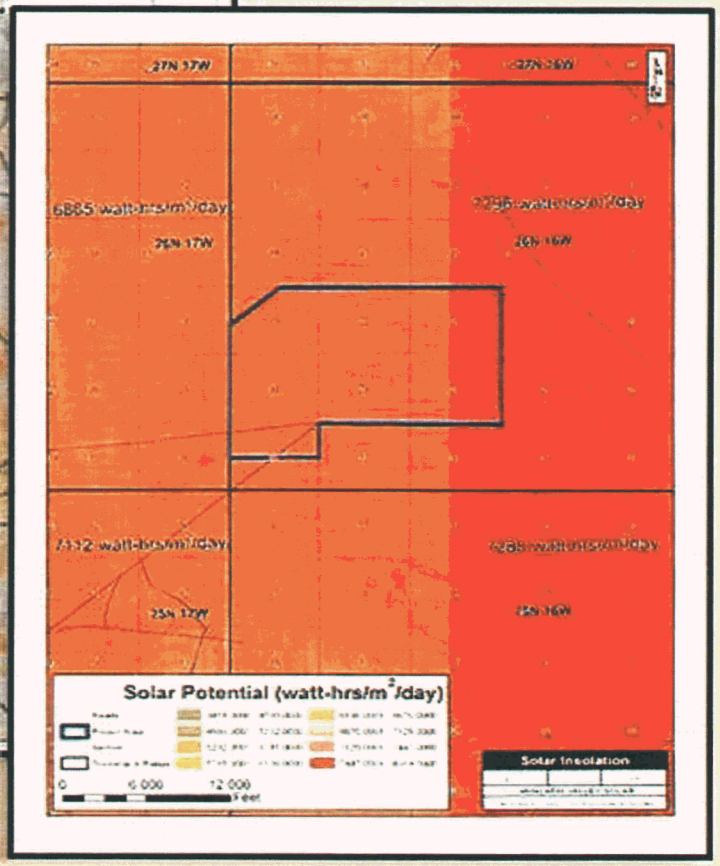
ADMINISTRATION

PROJECT OVERVIEW

WHY ARIZONA?





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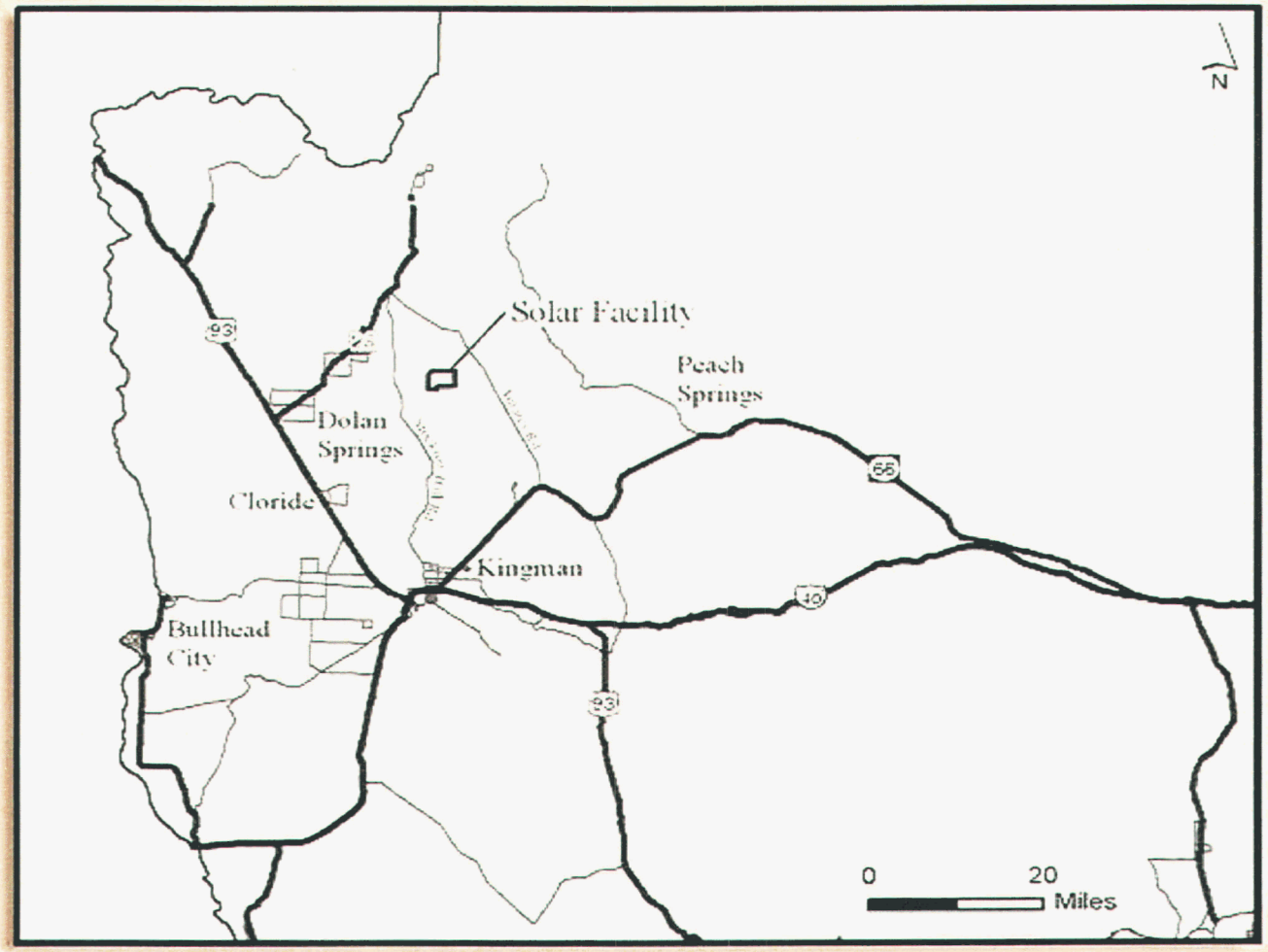
ADMINISTRATION

PROJECT OVERVIEW

PROJECT VICINITY



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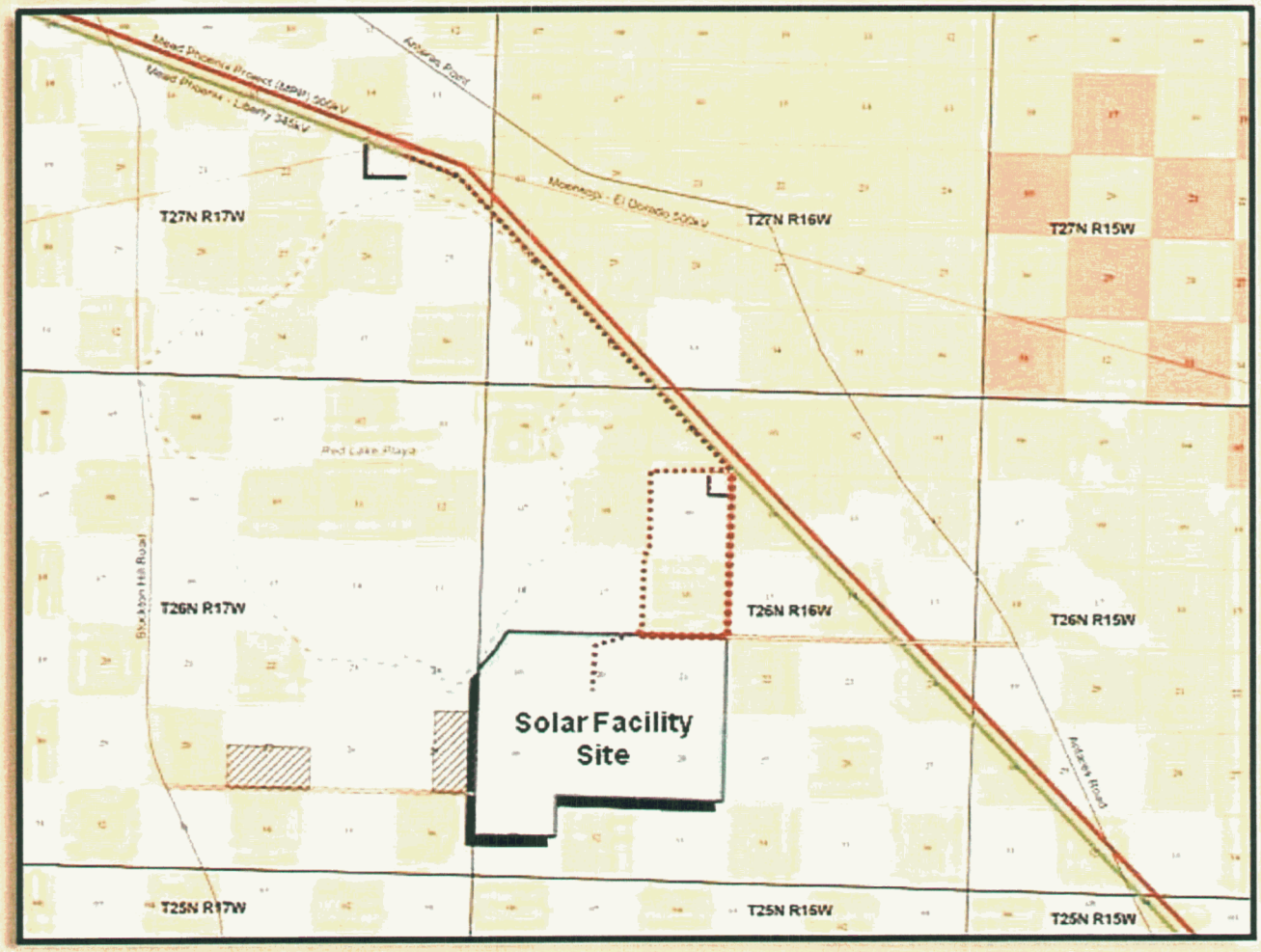
PROJECT OVERVIEW

PROJECT SITE



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ADMINISTRATION

PROJECT OVERVIEW

THE PROPOSED HUALAPAI VALLEY SOLAR FACILITY

- Private land
- 300+ days of excellent sunlight
- Very remote area
- Flat land, stable geology
- Proximity to transmission line

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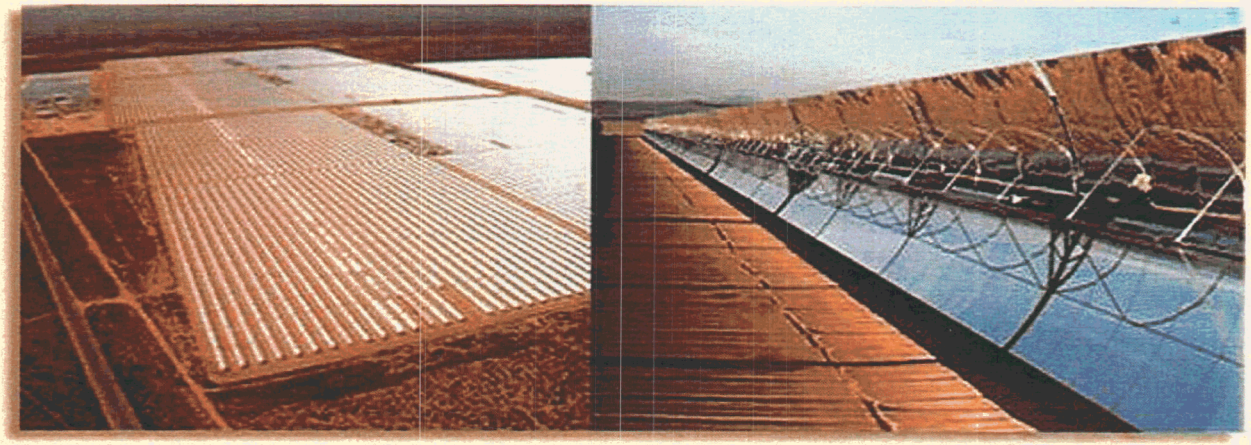
ADMINISTRATION

SOLAR TECHNOLOGY

SOLAR POWER TECHNOLOGIES



- Hualapai Valley Solar LLC has selected solar trough technology
- Solar trough is proven on utility scale
- Thermal storage provides flexibility to generate when the users need electricity

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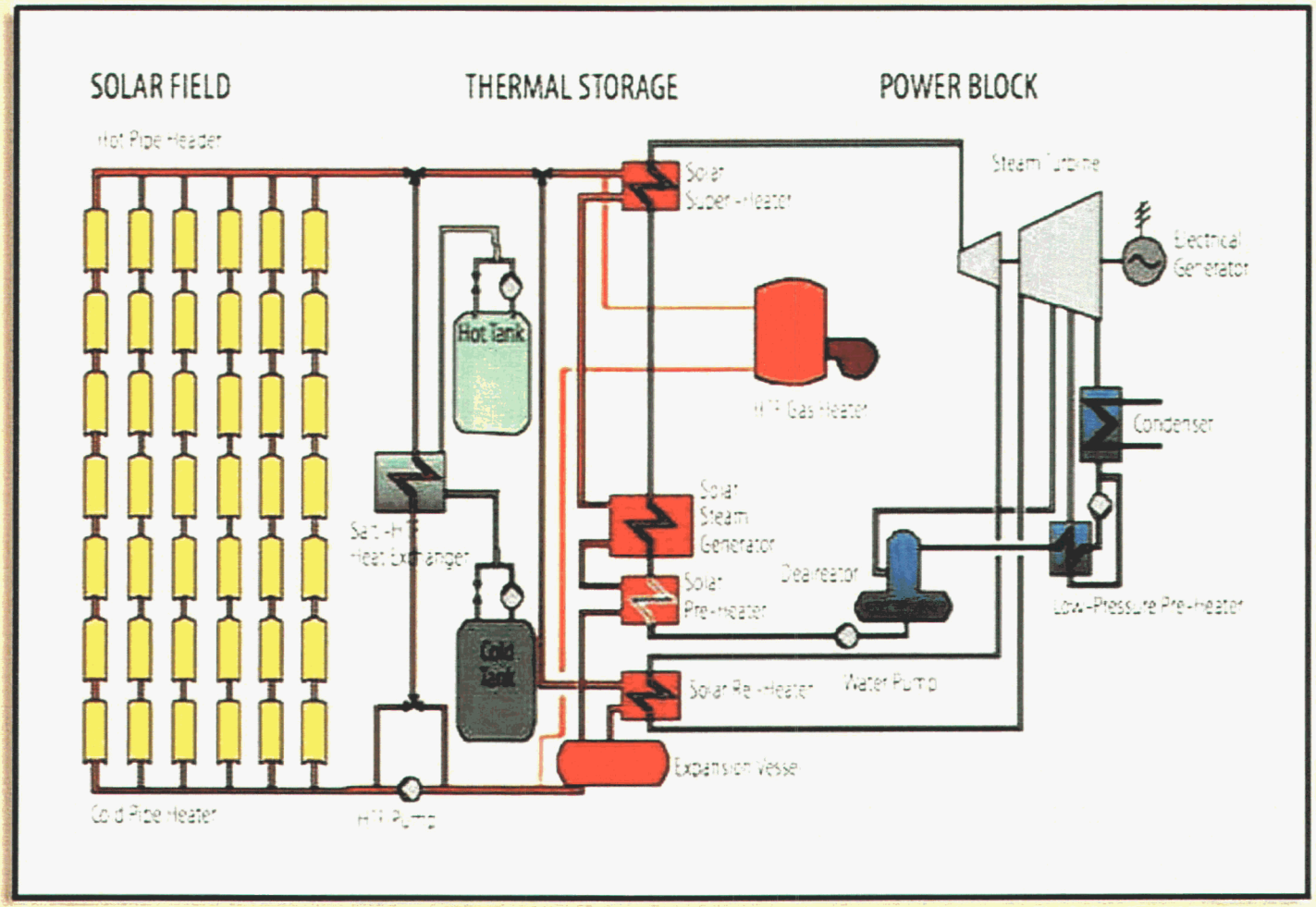
ADMINISTRATION

SOLAR TECHNOLOGY

SOLAR PLANT SCHEMATIC



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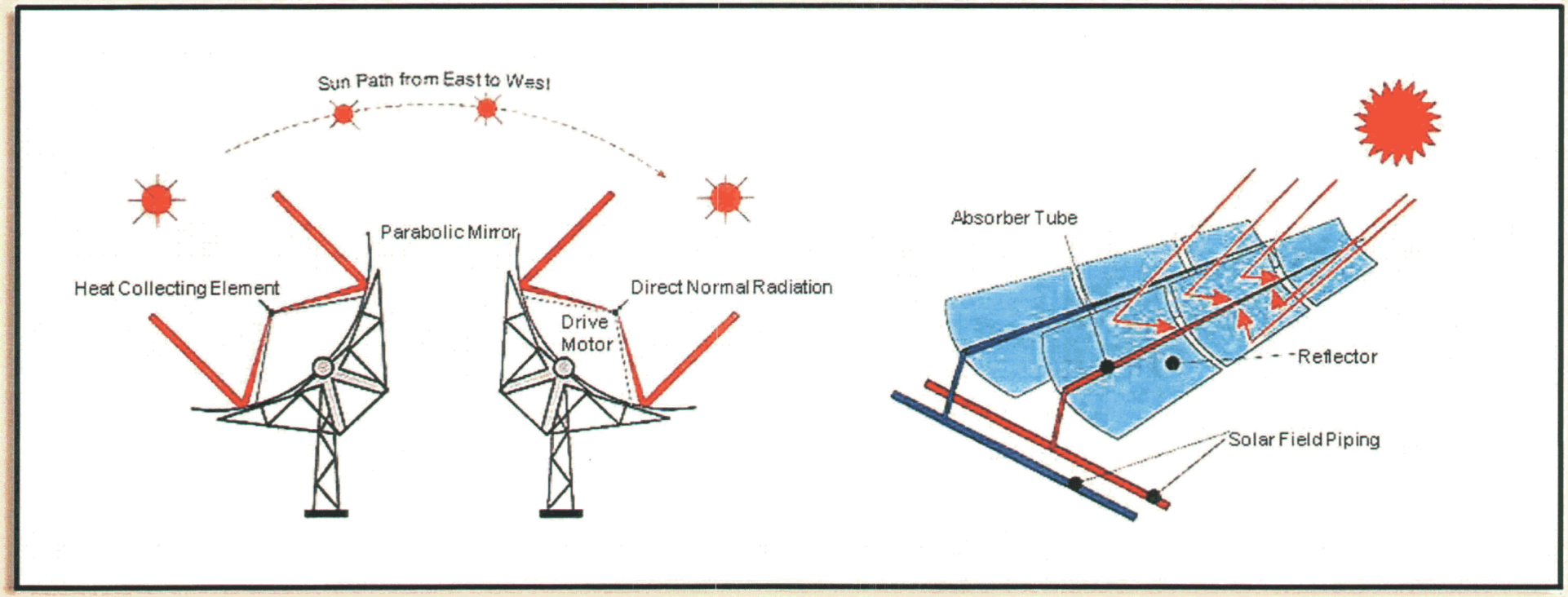
ADMINISTRATION

SOLAR TECHNOLOGY

SOLAR TROUGH OPERATION



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ADMINISTRATION

SOLAR TECHNOLOGY

COOLING TECHNOLOGIES

Preliminary Project Design

- Project design based on state-of-the-art evaporative cooling
- Standard design
- Water source options include waste water treatment plant effluent and ground water

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ADMINISTRATION

COOLING TECHNOLOGIES

- Once through cooling water
- Wet or evaporative cooling
- Dry or air cooling
- Hybrid cooling

SOLAR TECHNOLOGY

COOLING TECHNOLOGIES

Once Through Cooling Water

- Lowest capital cost
- Most efficient
- Requires large amount of water (~150,000 AF/Y) but none is lost

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ADMINISTRATION

SOLAR TECHNOLOGY

COOLING TECHNOLOGIES

Wet or Evaporative Cooling

- Moderate capital cost including water treatment system
- High efficiency
- Relies on water being lost to evaporation (~2,200 AF/Y) for cooling

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ADMINISTRATION

SOLAR TECHNOLOGY

COOLING TECHNOLOGIES

Dry or Air Cooling

- High capital and operating cost
- Lower energy efficiency - especially low during hot and dry periods when energy is needed most
- Higher energy requirement to run the system (high operating costs)
- No water consumption for cooling
- Site specific technical challenges
- Typically used where water is not available, or where it is too costly to treat

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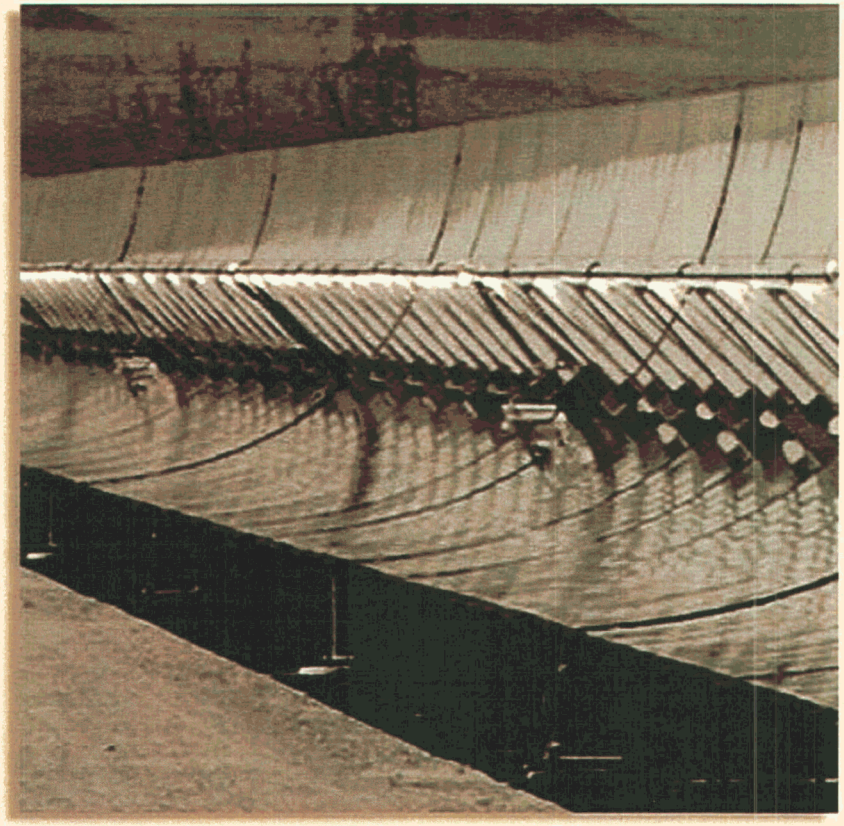
ADMINISTRATION

COOLING TECHNOLOGIES

Hybrid Cooling

- Highest capital cost (almost combination of evaporative and dry)
- Bias to wet cooling during high heat periods and dry cooling during cooler periods to minimize energy and efficiency losses
- Water consumption from 10-90% of evaporative cooling loss

HUALAPAI VALLEY SOLAR PROJECT



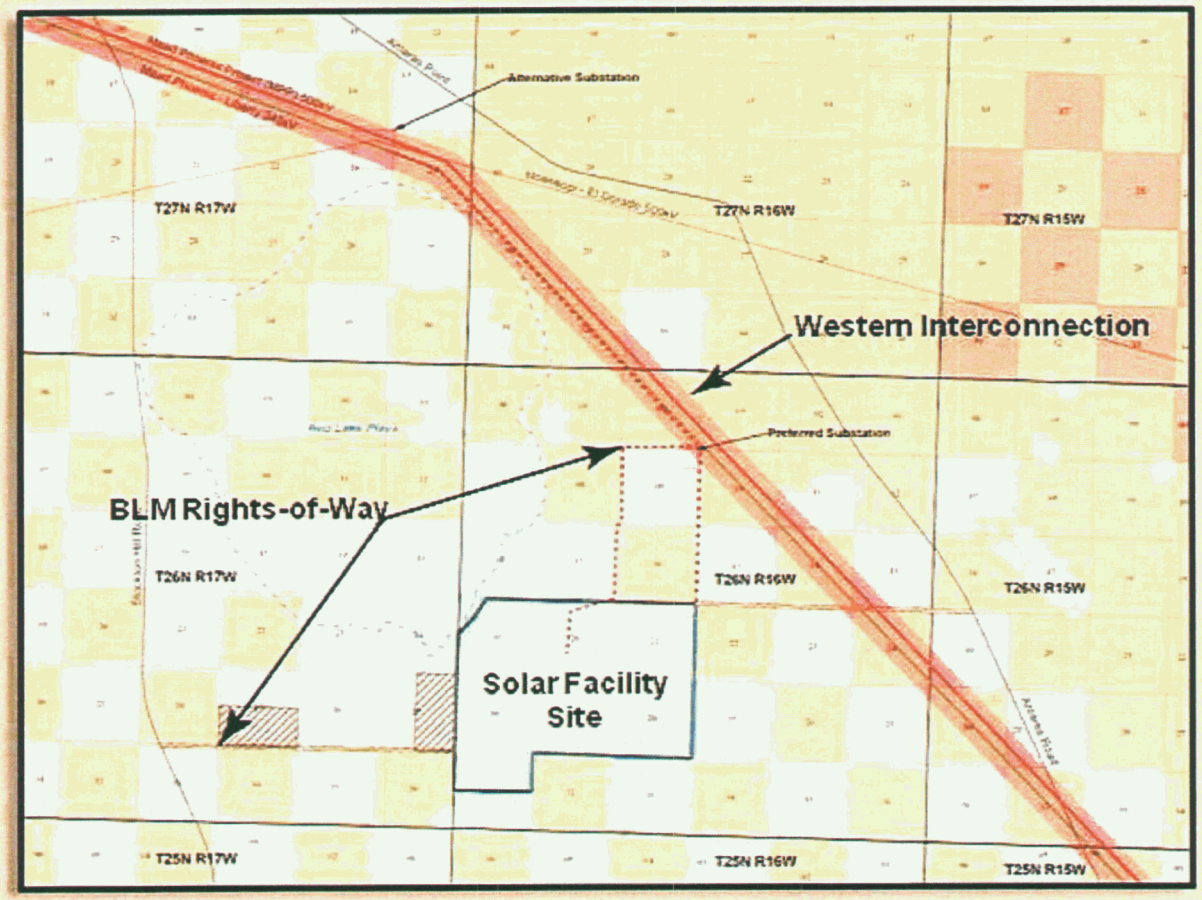
NEPA PROCESS

Western
AREA POWER
ADMINISTRATION

NEPA PROCESS

Federal Action Triggers NEPA Analysis

- Western – interconnection
- BLM – grant of right-of-way



Western
AREA POWER
ADMINISTRATION

NEPA PROCESS

Identify Project Purpose and Need

↓

Publish Notice of Intent to Prepare EIS

↓

WE ARE HERE → **Scoping Meeting / Comment Period**

↓

Prepare Draft EIS:
Project Need, Alternatives Screening,
Environmental Analysis

↓

Draft EIS Available for Review

↓

Draft EIS Comment Period

↓

Prepare Final EIS / Respond to Comments

↓

Final EIS Distribution

↓

Record(s) of Decision by
Western Area Power Administration
and Bureau of Land Management

Opportunities for Public Comment

Western
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ADMINISTRATION

NEPA PROCESS

SCOPING

- Initiation of NEPA Process
- Scoping Purpose
  - Gather comments
  - Identify issues

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ADMINISTRATION

NEPA PROCESS

RESOURCES FOR ANALYSIS IN THE EIS

- Impacts on protected, threatened, endangered, or sensitive species of animals or plants
- Impacts on migratory birds
- Noxious weeds, invasive, and non-native species
- Impacts on recreation and transportation
- Impacts on land use, wilderness, farmlands, and Areas of Critical Environmental Concern

NEPA PROCESS

RESOURCES FOR ANALYSIS IN THE EIS (CONT'D)

- Impacts on cultural or historical resources and tribal values
- Impacts on human health and safety
- Impacts on air, soil, and water resources
- Visual impacts
- Socioeconomic impacts and disproportionately high and adverse impacts to minority and low income populations

NEPA PROCESS

PRELIMINARY RESOURCE ISSUES

- Water
- Cultural
- Visual
- Other

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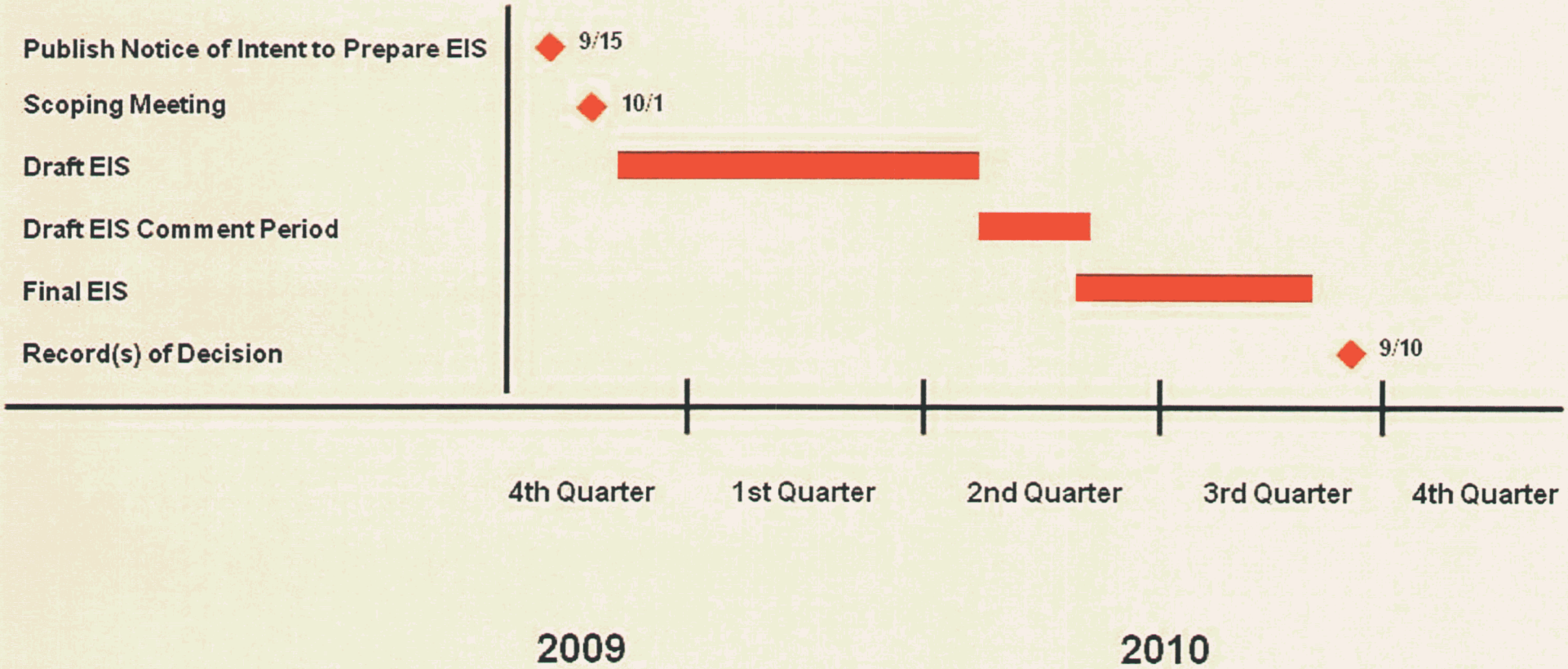
NEPA PROCESS

SCHEDULE



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ADMINISTRATION

NEPA PROCESS

STAYING INVOLVED

- Provide contact information
- Sign-in sheet at Scoping Meeting
- Provide comments
  - Drop box at tonight's meeting
  - Mail
- E-mail or Fax
- Online www.wapa.gov/transmission/hvsolar.htm
- Comment period closes October 23, 2009

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QUESTIONS

COMMENTS TO:

Ms. Mary Barger
National Environmental Policy Act Document Manager
Western Area Power Administration
P.O. Box 6457
Phoenix, AZ 85005
Telephone (602) 605-2524 / Fax (602) 605-2630
Email HVSolar@wapa.gov

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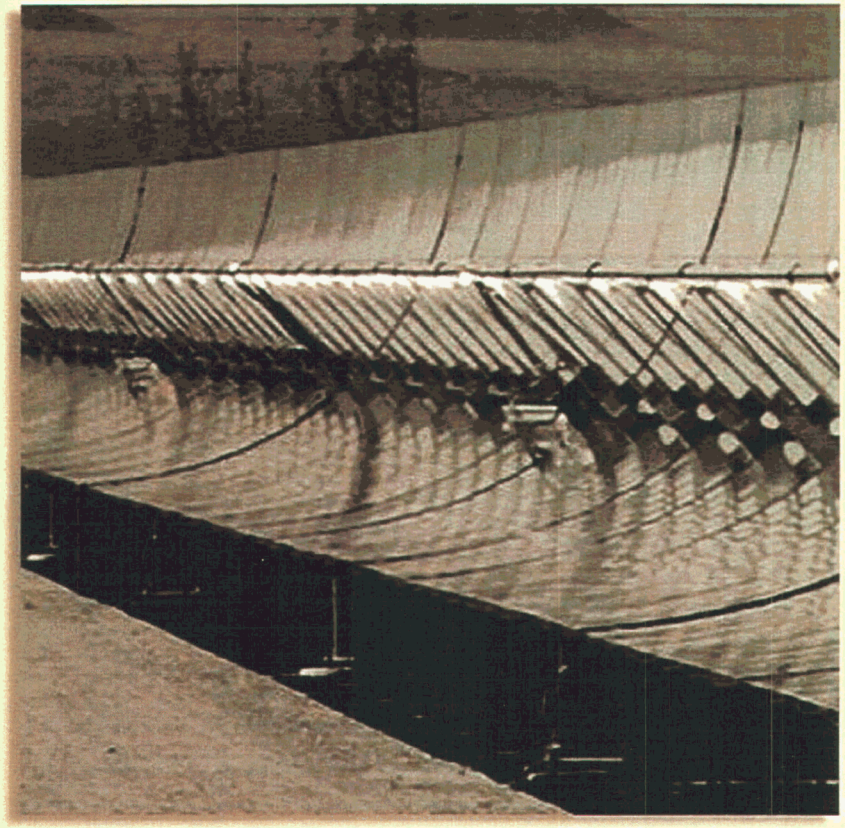
HUALAPAI VALLEY SOLAR PROJECT



QUESTIONS/COMMENTS

Western
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ADMINISTRATION

DISPLAY BOARDS

HUALAPAI VALLEY SOLAR PROJECT

WELCOME

TO THE PUBLIC SCOPING MEETING FOR THE HUALAPAI VALLEY SOLAR PROJECT

Western
AREA POWER
ADMINISTRATION

NEPA PROCESS

Identify Project Purpose and Need

↓

Publish Notice of Intent to Prepare EIS

↓

WE ARE HERE → **Scoping Meeting / Comment Period**

↓

Prepare Draft EIS:
Project Need, Alternatives Screening,
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↓

Final EIS Distribution

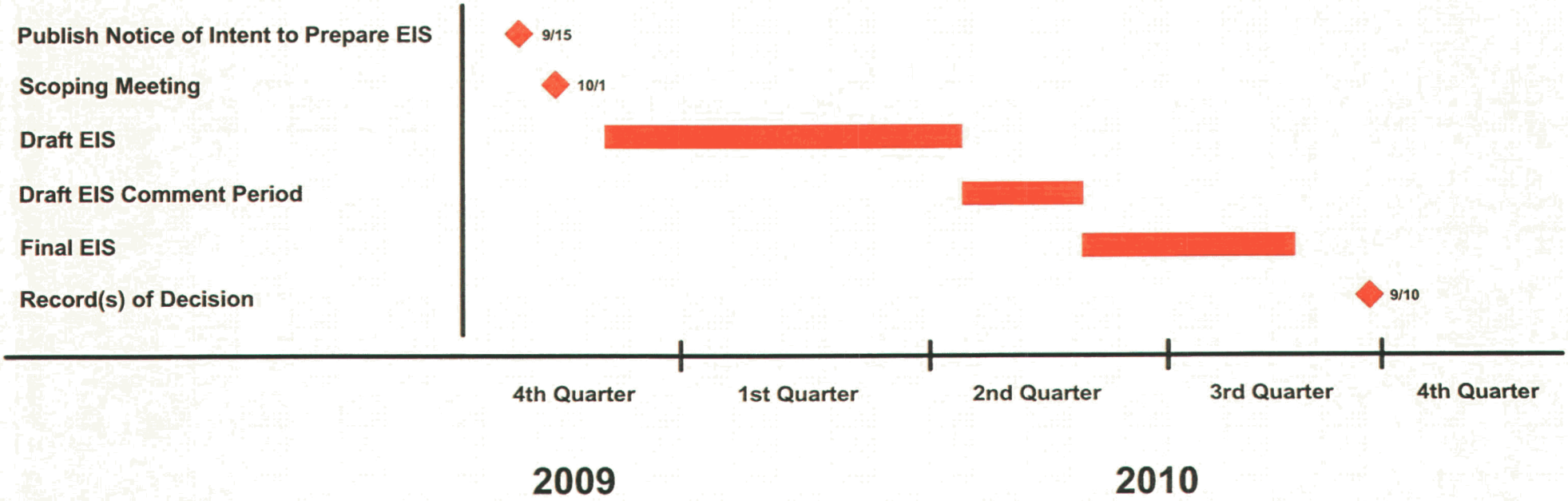
↓

Record(s) of Decision by
Western Area Power Administration
and Bureau of Land Management

Western AREA POWER ADMINISTRATION

Opportunities for Public Comment

SCHEDULE



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ENVIRONMENTAL RESOURCE ISSUES

WATER RESOURCES

CULTURAL AND HISTORICAL RESOURCES

VISUAL RESOURCES

BIOLOGICAL RESOURCES

AIR AND EARTH RESOURCES

FLOODPLAINS AND WETLANDS

LAND USE, RECREATION AND TRANSPORTATION

HUMAN HEALTH AND SAFETY

SOCIOECONOMICS

↓

ENVIRONMENTAL
IMPACT
STATEMENT

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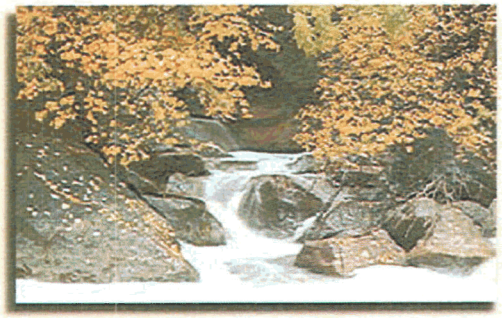
ADMINISTRATION

ENVIRONMENTAL RESOURCE ISSUES

VISUAL

BIOLOGICAL

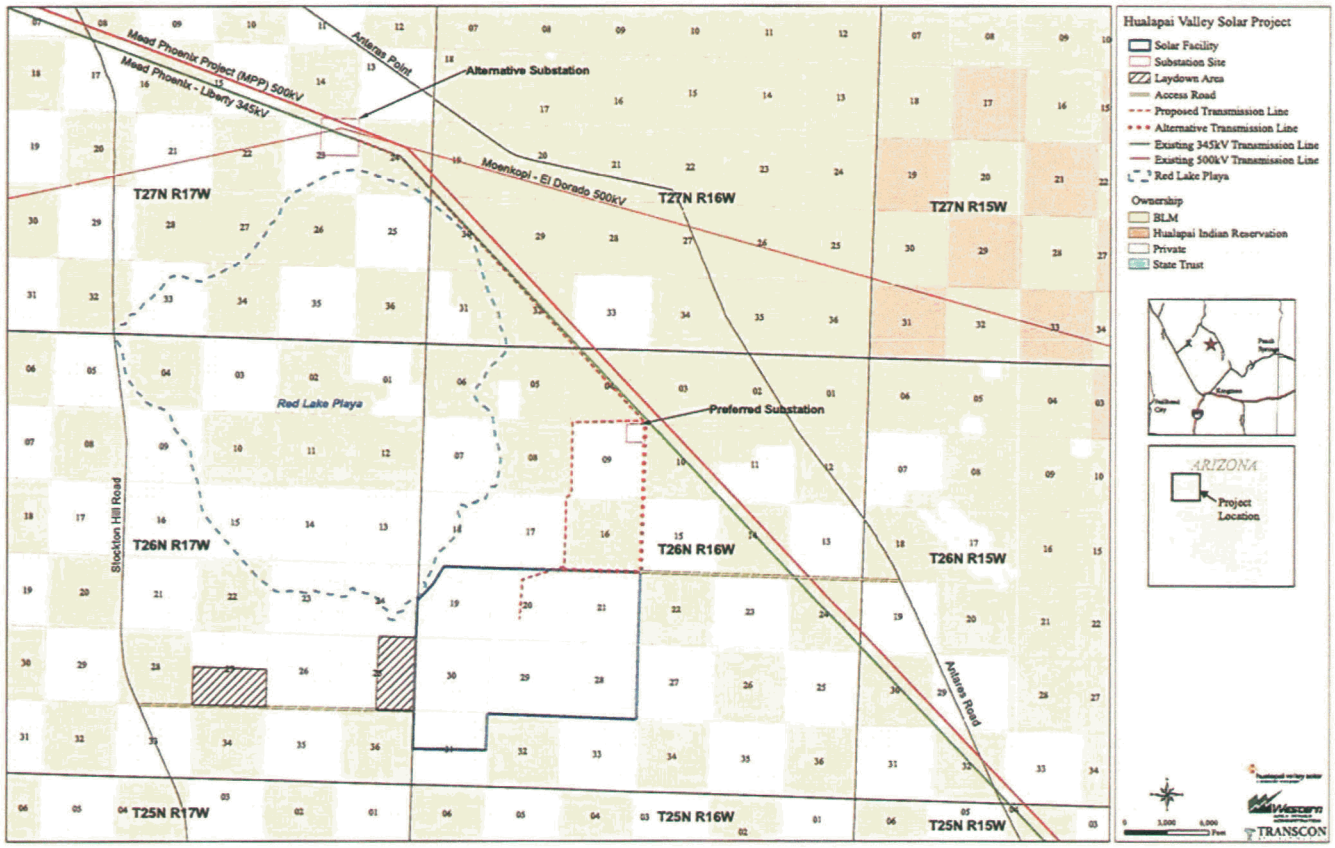
CULTURAL



WATER

Western
AREA POWER
ADMINISTRATION

WHERE IN ARIZONA



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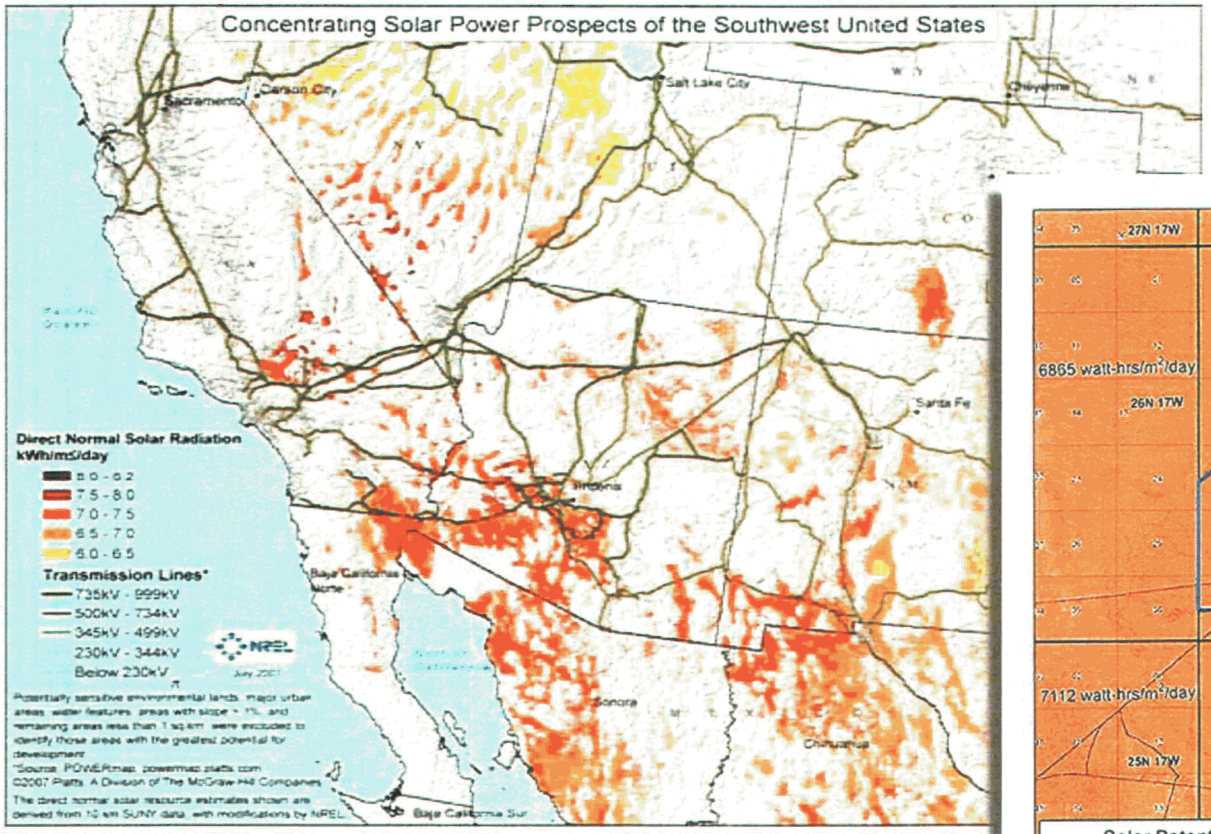
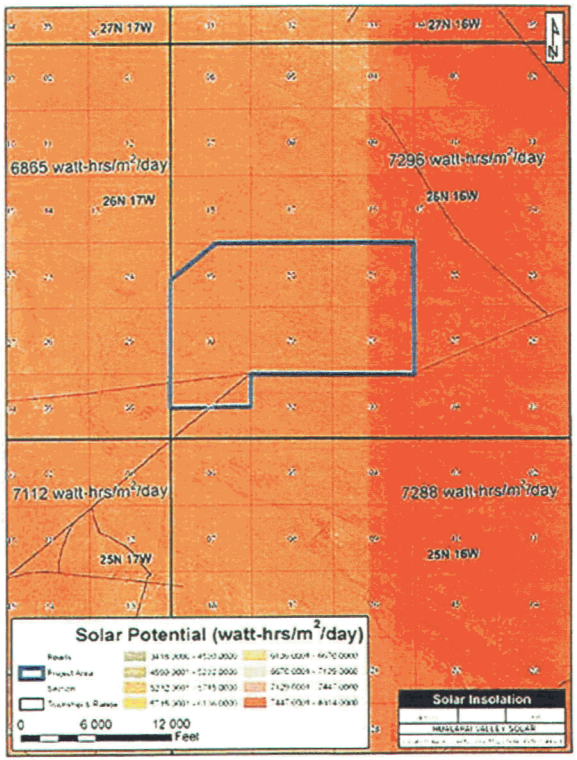
ADMINISTRATION

SOLAR POTENTIAL





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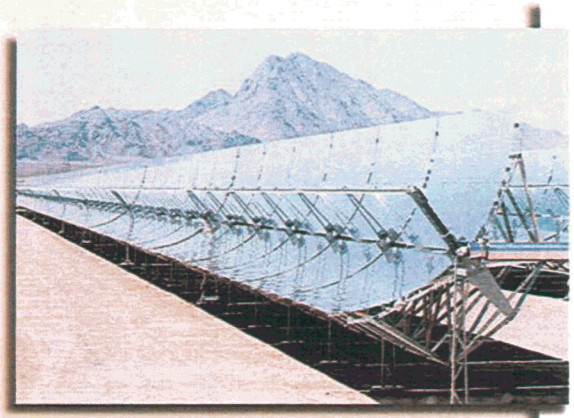
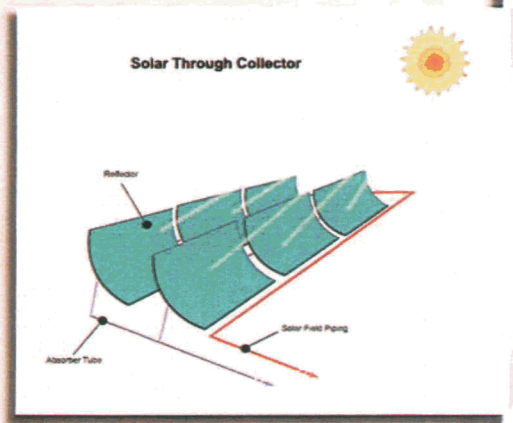
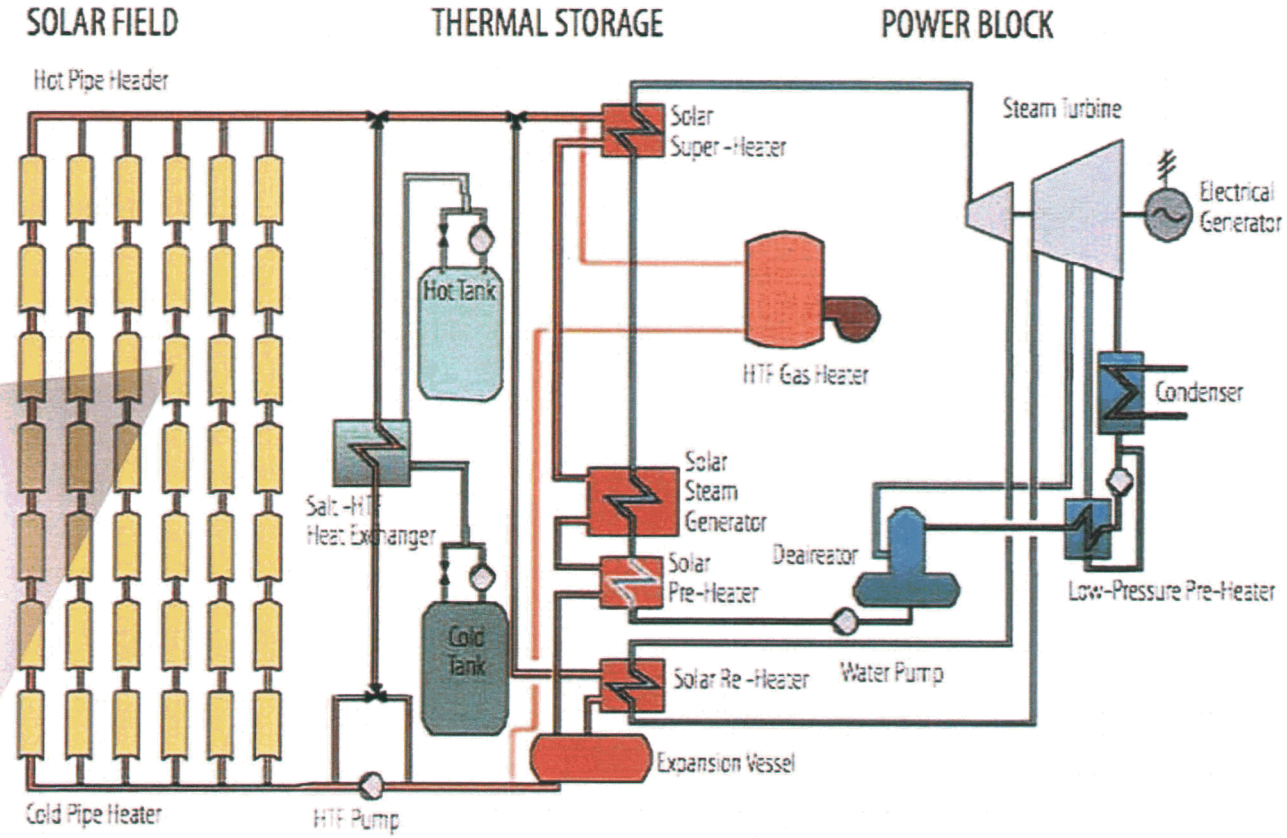
ADMINISTRATION

SOLAR PLANT







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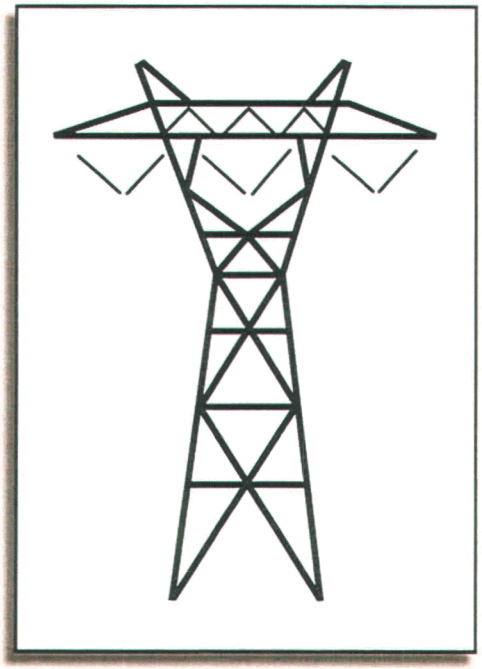
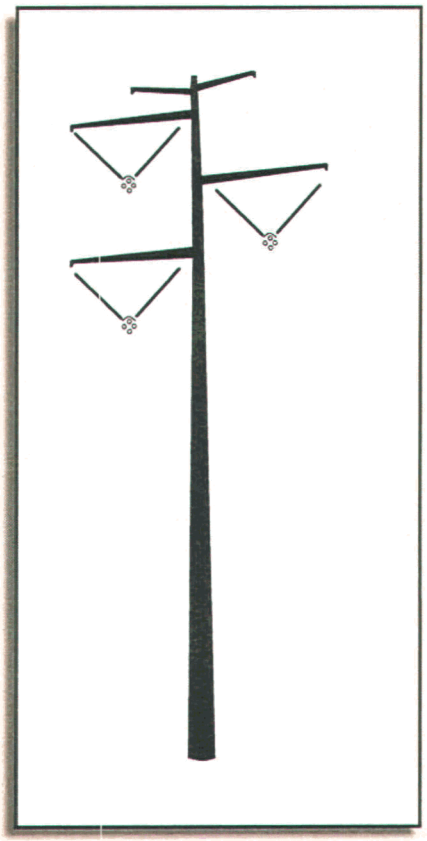
ADMINISTRATION

POWERLINE



500kV LATTICE STRUCTURE
Approximately 110' Tall



500kV MONOPOLE STRUCTURE
Approximately 140'-160' Tall

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ADMINISTRATION

APPROVALS

ENVIRONMENTAL IMPACT STATEMENT
(WESTERN-LEAD AGENCY
BUREAU OF LAND MANAGEMENT-COOPERATING AGENCY)

INTERCONNECTION
(WESTERN)

RIGHT-OF-WAY GRANT
(BUREAU OF LAND MANAGEMENT)

CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY
(STATE of ARIZONA)

AQUIFER PROTECTION PERMIT
(STATE of ARIZONA)

AIR PERMIT
(STATE of ARIZONA)

ZONING / LAND USE
(MOHAVE COUNTY)

GENERAL PLAN AMENDMENT
(MOHAVE COUNTY)

STAY INVOLVED

YOUR COMMENTS ARE WELCOME

Please provide your comments by October 23, 2009 to:

Ms. Mary Barger
National Environmental Policy Act Document Manager
Western Area Power Administration
PO Box 6457
Phoenix, AZ 85005
Telephone (602) 605-2524 / Fax (602) 605-2630
Email HVSolar@wapa.gov

Website www.wapa.gov/transmission/hvsolar.htm

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ADMINISTRATION

STAY INVOLVED

COMMENTS

Western
AREA POWER
ADMINISTRATION

BLANK COMMENT FORM AND PROJECT INFORMATION SHEET

HUALAPAI VALLEY SOLAR PROJECT

WE WELCOME YOUR COMMENTS

Your comments will help Western Area Power Administration define issues and alternatives for the proposed project. Please provide your comments in the space below, fold on the recommended lines, tape closed, and affix the proper postage. Please provide comments by **October 23, 2009**.

Mail comments to:
Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment –including your personal identifying information –may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Last Name: First Name:

Organization (if applicable) :

Mailing Address:

City, State, Zip:

E-mail Address (optional):

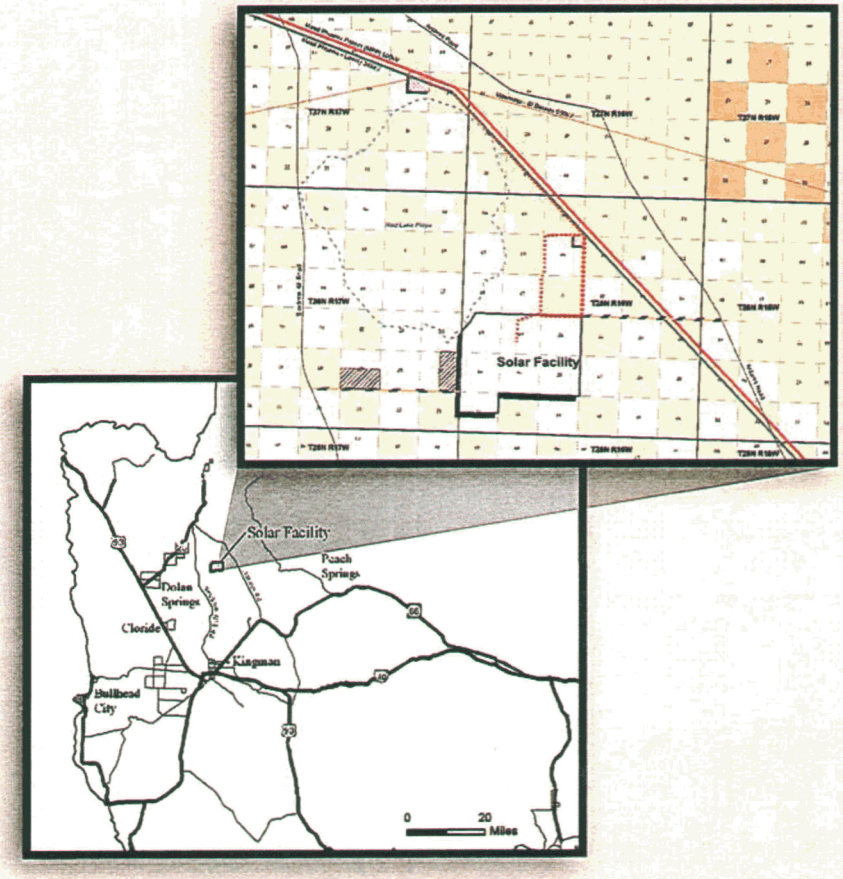
Comments:

Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☐Yes ☐No Please send me information by e-mail (*provide email address*)

HUALAPAI VALLEY SOLAR PROJECT

WE WELCOME YOUR COMMENTS



Hualapai Valley Solar LLC proposes to build a 340-MW solar power facility approximately 27 miles north of Kingman and 20 miles east of US 93. The solar power facility would be located on private land. A new transmission tie-line and access roads are proposed across Federal land, managed by the Bureau of Land Management.
The new transmission line would tie into Western's power transmission system.

Your comments will help define issues and alternatives for evaluation in the environmental impact statement Western and the Bureau of Land Management are preparing for the proposed project. The public scoping comment period closes **October 23, 2009.**

For more information or to provide comments visit the project website at:
www.wapa.gov/transmission/hvsolar.htm
or contact

Ms. Mary Barger
Western Area Power Administration
PO Box 6457, Phoenix, AZ 85005
telephone 602-605-2524, fax 602-605-2630
email HVSolar@wapa.gov

Western
AREA POWER
ADMINISTRATION

SIGN-IN SHEETS (UTILIZED)

PLEASE SIGN IN

HUALAPAI VALLEY SOLAR PROJECT

PUBLIC MEETING, KINGMAN HIGH SCHOOL, OCTOBER 1, 2009

Western AREA POWER ADMINISTRATION

NAME*	AFFILIATION AND/OR INTEREST IN THE PROJECT* (landowner, resident, etc.)	ADDRESS*
Mary Mendola	Mohave County	Street: 7761 E. Pioneer Dr. City: Kingman State: AZ Zip Code: 86401 Email (optional): MendoM@co.Mohave.az.us Phone (optional): 928-753-0723 x4429
MARK SHAVER		Street: 40541 Hiller Dr City: Meadview State: AZ Zip Code: 86444 Email (optional): Phone (optional): 928-530-2211
CLARICE DAVIS	AGS93	Street: 3073 N. OAKNEST City: K State: AZ Zip Code: 86401 Email (optional): CLARICEDAVIS125@Gmail.com Phone (optional):
EDMUND FELLMETH	MOHAVE CTY	Street: 11675 E Pueblo Rose Ln City: Kingman State: AZ Zip Code: 86401 Email (optional): EJFELLMETHEY@YAHOO.COM Phone (optional): 262-949-4038
Jim Smith	Mohave County	Street: 1273N Friendship Pass City: Kingman State: AZ Zip Code: 86401 Email (optional): Phone (optional):

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HUALAPAI VALLEY SOLAR PROJECT

PUBLIC MEETING, KINGMAN HIGH SCHOOL, OCTOBER 1, 2009

Western AREA POWER ADMINISTRATION

NAME*	AFFILIATION AND/OR INTEREST IN THE PROJECT* (landowner, resident, etc.)	ADDRESS* 4054 W. Hiller Dr
Mercedes Stout		Street: City: Meadview State: AZ Zip Code: 86444 Email (optional): Phone (optional): 928-530-3129
PETE TOMIELLO	LAND OWNER	Street: 15691 STAGECOACH WELL DR. City: KINGMAN State: AZ Zip Code: 86401 Email (optional): Phone (optional): 928 692 9459
PATI LEWIS	INVESTOR	Street: 5550 N CORAL BAY City: KINGMAN State: AZ Zip Code: 86409 Email (optional): pattiLewis.NAME Phone (optional): 928 757-4972
JOANNA MYNAR L	LAND OWNER	Street: PO BOX 8101 City: HUALAPAI State: AZ Zip Code: 86412 Email (optional): CACTUS AZ @ CITLINK NET Phone (optional):
LEO HORNER	LAND OWNER	Street: 864 Country Club Drive City: Kingman State: AZ Zip Code: 86401 Email (optional): Phone (optional):

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HUALAPAI VALLEY SOLAR PROJECT

PUBLIC MEETING, KINGMAN HIGH SCHOOL, OCTOBER 1, 2009

Western AREA POWER ADMINISTRATION

NAME*	AFFILIATION AND/OR INTEREST IN THE PROJECT* (landowner, resident, etc.)	ADDRESS*
TOM CARTER	GENERAL	Street: P.O. 4602 City: KINGMAN State: AZ Zip Code: 86402 Email (optional): Phone (optional):
RAY BERKEBILE	RESIDENT GENERAL	Street: 3726 N SILVER SPRINGS RD City: KINGMAN State: AZ Zip Code: 86401 Email (optional): rberkeb@citlink.net Phone (optional): 928 691 3391
ROBERT BRAND	GENERAL	Street: 4450 GLEN Rd City: KINGMAN State: AZ Zip Code: 86409 Email (optional): TREEBRAND@FRONTIERNET.NET Phone (optional): 9286928733
Robert & Tom FENWICK	LANDOWNER	Street: P.O. BX 6715 City: Kingman State: AZ Zip Code: 86402 Email (optional): Phone (optional): 757-3929
JOHN & JILL LUTENSKE	SANDRIVER RANCH	Street: SANDRIVER RANCH ROAD 11290 E. City: Kingman State: AZ Zip Code: 86401 ~~Email (optional):~~ ~~Phone (optional):~~

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PUBLIC MEETING, KINGMAN HIGH SCHOOL, OCTOBER 1, 2009

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NAME*	AFFILIATION AND/OR INTEREST IN THE PROJECT* (landowner, resident, etc.)	ADDRESS*
BRANDON WARNER	MCC TRAINING	Street: 1971 JAGGERSON City: KINGMAN State: AZ Zip Code: 86401 Email (optional): BWARNER2@MOHAVE.EDU Phone (optional): (928) 757-0849
GARY WATKINS	RESIDENT	Street: 2304 SNAVELY City: KINGMAN State: AZ Zip Code: 86409 Email (optional): GWATK54@YAHOO.COM Phone (optional):
PHILIP LUNDQUIST	resident (Kingman)	Street: 975 Gordon Drive City: Kingman State: AZ Zip Code: 86409 Email (optional): philiplundquist@yahoo.com Phone (optional): —
JACKIE NECKELS	BLM	Street: 2755 MISSION BLVD City: Kingman State: AZ Zip Code: 86409 Email (optional): Jacqueline_neckels@blm.gov Phone (optional):
VICKI & GLENN HOAG	VALLE VISTA RESIDENTS	Street: 7472 SAWMILL DR City: KINGMAN State: MI Zip Code: 86401 Email (optional): VHOAG556@AOL.COM Phone (optional):

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Jack Ehrhardt	Resident	Street: 4105 N. Adams St. City: Kingman State: AZ Zip Code: 86409 Email (optional): CerBatN@citlink.net Phone (optional): 9287276100
Mike Packer	Landowner	Street: P.O. Box 6279 City: Kingman, AZ 86402 State: Zip Code: Email (optional): Phone (optional):
Robert Hamilton		Street: City: State: Zip Code: Email (optional): Phone (optional):
Megan Oplinger	Interested Party	Street: McLaughlin Dr. 1808 Stockton Hill City: Kingman State: Zip Code: Email (optional): Phone (optional):
Debra Martin	Resident	Street: 7370 E. Dome Rock Dr. City: Kingman State: AZ Zip Code: 86401 Email (optional): Phone (optional):

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PUBLIC MEETING, KINGMAN HIGH SCHOOL, OCTOBER 1, 2009

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NAME*	AFFILIATION AND/OR INTEREST IN THE PROJECT* (landowner, resident, etc.)	ADDRESS*
Jean Bishop		Street: 9917 N 6th ST City: Chloride State: AZ Zip Code: 86431 Email (optional): Chloridejean@yahoo.com Phone (optional): 715-1560
Jim Kanelos		Street: 4402 Oatman Rd City: Golden Valley State: AS Zip Code: 83413 Email (optional): SVSINC@live.com Phone (optional): 565-2453
MATTHEW CAPALBY		Street: 3070 TROXLER CIR. City: FLAGSTAFF State: AZ Zip Code: 86001 Email (optional): MCAPALBY@gmail.com Phone (optional): 928-814-2789
Prestene Garnenez	Just curious	Street: 11660 Mayfield Ave City: Los Angeles State: LA Zip Code: 90049 Email (optional): pgarnenez@hotmail.com Phone (optional):
GENE BISHOP		Street: 251 N. FRIENDSHIP PASS City: Kingman State: AZ Zip Code: 86401 Email (optional): rgbishop@usa.NET Phone (optional):

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JOHN A. Corella concerned citizen ANCOREINT@AOL.com 92253
PLEASE SIGN IN
Melissa Rose concerned citizen 92253

HUALAPAI VALLEY SOLAR PROJECT

PUBLIC MEETING, KINGMAN HIGH SCHOOL, OCTOBER 1, 2009

Western AREA POWER ADMINISTRATION

NAME*	AFFILIATION AND/OR INTEREST IN THE PROJECT* (landowner, resident, etc.)	ADDRESS*
Judi Scaliatine	Hwy 93 ags	Street: 11761 E. BIG ELK DR. City: KINGMAN State: AZ Zip Code: 86401 Email (optional): Hwy93ags@ymail.com Phone (optional): 909-717-3589
ANNE WESTENHAVER	RESIDENT	Street: 2429 KAREN City: KINGMAN State: AZ Zip Code: 86401 Email (optional): Phone (optional):
Lou Dreher	Resident	Street: 3069 Southamptn City: Kingman State: AZ Zip Code: 86401 Email (optional): Phone (optional): (928) 272-9116
Geoff Settles	Resident	Street: 372 W. Drifting Shadow Lane City: Kingman State: AZ Zip Code: 86409 Email (optional): Phone (optional):
Janice Stroud	AZ Game + Fish	Street: 5325 N Stockton Hill Rd City: Kingman State: AZ Zip Code: 86409 Email (optional): jstroud@azgfd.gov Phone (optional):

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QUESTION AND COMMENT CARD (UTILIZED AT PUBLIC MEETING)

HUALAPAI VALLEY SOLAR PROJECT

PUBLIC MEETING AT KINGMAN HIGH SCHOOL
OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Alcorn First Name: Ruby

Mailing Address*: 2532 Southern Ave

City, State, Zip*: Kingman AZ - 86401

Question(s)/Comment(s):

1. 2400 acre feet - Can you break it down & how many gallons per minute will be used.?

2. Is it true that you are planning to drill instead of piping the waste water because of cost.? What is the cost of piping waste water to plant?

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Western AREA POWER ADMINISTRATION

HUALAPAI VALLEY SOLAR PROJECT

PUBLIC MEETING AT KINGMAN HIGH SCHOOL
OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: RAY BERKEBILE First Name: RAY

Mailing Address*: 3726 N SILVER SPRINGS RD

City, State, Zip*: KINGMAN, AZ 86401

Question(s)/Comment(s):

① EI, SHOULD INCLUDE REQUIREMENT THAT THE PROJECT SHALL MONITOR AQUAFER AT 3 POINTS FOR H_2O DROP; LIMIT OF "X" FEET REQUIRE PLANT SHUTDOWN UNTIL AQUAFER RECHARGE

② REQUIRE MONITORING OF LEVELS (H_2O) IN WELLS AROUND PROJECT BEFORE & DURING 20 YEAR LIFE OF PROJECT; GIVE LIMITS ON WELL LEVEL DROPS

③ MONITOR FLORA & FAUNA LISTED IN MOHAVE GENERAL PLAN AS ENDANGERED, ETC, IN PROJECT GENEAL AREA

④ MONITOR ELECTRICAL, MAGNETIC RADIATION FROM 500 kV LINES, I'M GLAD I DON'T LIVE OR HAVE PROPERTY NEAR THOSE LINES!

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PUBLIC MEETING AT KINGMAN HIGH SCHOOL
OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: CARTER First Name: Tom

Mailing Address*: P.O. BOX 4002

City, State, Zip*: KINGMAN, AZ. 86402

Question(s)/Comment(s):

PLEASE SEND A COPY OF THE SLIDE PRESENTATION TO ME.

THANK YOU!

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OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Davidson First Name: Kevin

Mailing Address*: 3069 Southern Ave

City, State, Zip*: Kingman, AZ 86401

Question(s)/Comment(s):

Is there sufficient capacity on the 500 KV & 345 KV powerlines to carry the output of the 340 MW powerplant proposed by Hualapai Valley Solar? If not, what type of additional power line will be required to send the power to markets outside of Mohave County?

Will the Best Management Practices in the forthcoming BLM's Solar Programmatic EIS be applied to this project?

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PUBLIC MEETING AT KINGMAN HIGH SCHOOL
OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: DAVIS First Name: CLARICE

Mailing Address*: 3073 N. QUAILNEST RD

City, State, Zip*: K, AZ 86401

Question(s)/Comment(s): WILL YOU BE GETTING TAX EXEMPTIONS AND HOW MUCH.

How much water will you use per day?
How much will be from ground water?
How much will be re-claimed / re-used?
WHERE DOES THE WATER GO if NOT re-claimed?
~~What wa~~
WHEN WAS THE LAST WATER STUDY IN THAT AREA AND who did it.

WHAT group will be responsible for CERTIFYING ENDANGERED species or ANIMAL MIGRATION PATHWAYS will NOT be VIOLATED?

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OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Robert Fenwick First Name:

Mailing Address*:

City, State, Zip*:

Question(s)/Comment(s):

- I'm concerned about the validity of the Roads Water report.
- Concerned about the cost and sensibility of water pipeline.
- Concerned water balance in modern condition
- Believe dry cool can be effective
- Concerned that power will go to California
- Schedule appear unrealistic in particular line going through the state

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OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: HOAG First Name: VICKI

Mailing Address*: 7472 SAWMILL DRIVE

City, State, Zip*: KINGMAN AZ 86401

(1) **Question(s)/Comment(s):** You applied for 4000 acre feet - with the use of effluent from the City of Kingman, will you commit to using as much effluent as can be supplied to reduce use of the aquifer (ground water)? (4000 original - now 2240 AFT, - 1700 effluent, need only 600?) Will the water usage be monitored/metered?? Transparency

(2) - Will you make at least 10% of power available to Mohave County residents through current utilities.

(3) - How control dust from trucks?

(4) - How are you planning on dealing with fugitive reflections - especially towards the south & west?

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OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Kanelos First Name: Jim

Mailing Address*: 4402 Oatman Rd.

City, State, Zip*: Golden Valley

Question(s)/Comment(s): Will a Impact Study be done on Realestate values going down, around this project?

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OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Lewis First Name: Patti

Mailing Address*: 5850 N Coral Bay

City, State, Zip*: Kingman, AZ 86409

Question(s)/Comment(s): There is proposed to be some 2400 semi trucks needed to deliver construction materials to this job site. 2400 X 2 (back + forth) = 4800
There are 1500 construction workers 1500 X 2 (B+F) 3000
There will be 150,000 looky loos (according to Mayor Salem 150,000 X 2 (B+F) = 300,000
Each of these numbers represents new traffic added to Stockton Hill Rd. 307800 or more. Will the road + infrastructure be in place before construction begins? We lost 3 deer in the past 30 days because the road is too narrow + traffic already too high.

(2) Will there be fencing put up to protect our cattle?

Commenter wants roads forced to keep livestock within fences, consider

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QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: LUTENSKE First Name: JOHN - JIZZ

Mailing Address*: 11290 E Sandriver Ranch Road

City, State, Zip*: KINGMAN AZ 86401

Question(s)/Comment(s): BOTH

JUST WHAT comments could be made that would STOP THIS PROJECT?

comment:

IT Seems that you are going to GIVE THIS STUDY some TIME - THEN do what you want - in the name of energy - PROGRESS -

(FAIR TRIAL) - THEN HANG US!

GIVE US a ~~fair TR~~

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QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: ~~Mike~~ Packer First Name: Mike

Mailing Address*: P.O. Box 6279

City, State, Zip*: Kingman AZ 86401

Question(s)/Comment(s):

2 Does Western own wires that go along 93 - Near B.S. Wash

If they do will they get an EIS

3 there as well

1 How is 5,000,000 gal of ~~West~~ A year water even being considered as a help in water savings compared to 100,000,000 gal per year

1 When they clean troughs ~~And~~ when Cacioona Cromanum, Salt, Formale. Has coated them like our swamp coolers, what acid will they use!

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and what effect will that have on the environment

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QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Puglisi First Name: Austin

Mailing Address*:

City, State, Zip*:

Question(s)/Comment(s): How will the right-of-way for the pipeline be obtained? Will it include eminent domain?

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QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Puglisi First Name: Austin

Mailing Address*:

City, State, Zip*:

Question(s)/Comment(s): How many miles of new transmission lines will be built along with this project? How much of that will be on public lands & how much will be on private lands?

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QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Settles First Name: Geoff

Mailing Address*: [redacted]

City, State, Zip*: Kingman, AZ 86409

Question(s)/Comment(s):

- How much of the 2400 acre feet of water will be the treatment H_2O?
- How are they going to pump the water from the treatment plant? Like gas engines, electric pumps, etc....
- How much water is being used to create the steam compared to cooling?
- When would the pipe line and water treatment plant be ready? Compared to the solar plant?

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QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Smith First Name: JAMES

Mailing Address*: 1223 N FRIENDSHIP PASS

City, State, Zip*: KINGMAN, AZ. 86401

Question(s)/Comment(s):

DONT USE OUR GROUND WATER

WHERE (ON WHAT WEBSITE) WILL ALL THIS INFORMATION AND DRAFTS be posted for reviewing during this whole open process?

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THANK YOU FOR COMING TO THE MEETING

Western AREA POWER ADMINISTRATION

HUALAPAI VALLEY SOLAR PROJECT

PUBLIC MEETING AT KINGMAN HIGH SCHOOL
OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: Stout First Name: Mercedes

Mailing Address*: 4654 W. Hiller Dr

City, State, Zip*: Meadview, AZ 86444

Question(s)/Comment(s):

How much water will be use each day or continiously?
How long this product, Life long, guaranteed
after no so long of use, what then?
Is that the time, when water exhousted?

* Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment –including your personal identifying information –may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

THANK YOU FOR COMING TO THE MEETING

Western AREA POWER ADMINISTRATION

HUALAPAI VALLEY SOLAR PROJECT

PUBLIC MEETING AT KINGMAN HIGH SCHOOL
OCTOBER 1, 2009

QUESTION AND COMMENT CARD

Please use this card to identify questions or comments you would like to address during the meeting.

Last Name*: WATKINS First Name: MARY

Mailing Address*: 2304 SNAVELY

City, State, Zip*: KINGMAN, AZ 86409

Question(s)/Comment(s):

COMPARED TO STEAM GENERATING PLANTS IN AREA HOW MUCH ELECTRICITY WILL BE PRODUCED BY YOUR SOLAR PLANT?

* Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment –including your personal identifying information –may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

THANK YOU FOR COMING TO THE MEETING

Western AREA POWER ADMINISTRATION

APPENDIX D

COMMENTS

August 27, 2009

Mohave County Development Services
P.O. Box 7000
Kingman, AZ 86402-7000

RE: Proposed Hualapai Valley Solar Area Plan

Dear Sirs,

I am the manager of a company that owns two 40-acre parcels in Sec 21, T26N, R16W. The development of renewable energy is important to our country and this area is well suited for solar energy projects. I am in full support of the proposed changes to the General Plan that would allow the construction and operation of a solar power plant in Hualapai Valley.

One concern I have is the prudent use of groundwater. I understand that Hualapai Valley Solar is investigating the use of treated waste water effluent from the City of Kingman to supply a portion of the water used for cooling. This approach or any other water/air cooling system should be fully investigated to ensure that groundwater is used wisely.

Thank you for allowing me to express my opinion on this matter.

Sincerely,

Luis Vega
Manager, RL 33-68, LLC.
P.O. Box 4045
Kingman, AZ 86402-4045

SUN WEST BIOFUELS LLC

August 31, 2009

Mohave County Development Services
3675 East Andy Devine Avenue
Kingman, AZ 86401

ATTN: Nicholas S. Hont P.E.

RE: HUALAPAI VALLEY SOLAR

Mr. Hont:

This letter is to serve as a LETTER OF SUPPORT for the proposed 340MW solar power plant (Hualapai Valley Solar project) to be located 27 miles north of Kingman at the Red Lake area.

As I am sure you are aware, this proposed solar plant is a potential customer of ours. Our industry will be the first of hopefully many support industries for this solar plant to locate in Mohave County.

Sun West Biofuels and Hualapai Valley Solar are both dedicated to renewable energy and the future economic growth of Mohave County. We feel this proposed facility and renewable industry as a whole are positive for Mohave County.

We feel that the proactive steps that Hualapai Valley Solar has taken to address public concern and protect natural resources, such as using effluent vs. groundwater and biodiesel vs. fossil fuel are reflective of the types of businesses we want in this county.

Sincerely,

Rick Neal
Managing Director
Sun West Biofuels

9.25.09

Dear Ms. Barger,

My name is Jim Smith and I live in Kingman, AZ.

I am writting in concern to the Hualapai Valley Solar Project in Mohave County

Frist off, I am not agenst Solar, I think its a great idea.

What I'm agenst is the use of our water.

Hualapai Valley Solar does not know exactly how much water they will need to run this generator and untill they do and can get it from 100% wast water, I for one would be in favor of sending them back to the drawing bord, and comming back with an idea that is right for all of us.

Its what a good naghbor would do.

Thank You.

James D. Smith

September 30, 2009

Ms. Mary Barger
NEPA document Manager
Western Area Power Admin.
Desert Southwest Region
PO Box 6457
615 So. 43rd. Ave.
Phoenix AZ 85005

Dear Ms. Barger,

We are writing in regards to the upcoming EIS report. We feel that the 10 issues you have raised are all being or soon will be violated by Albiasa Corp., Planning & Zoning, and the Board of Supervisor of Kingman, AZ.

The residents of this narrow rural agricultural valley (zoned residential/agricultural), we object strongly to this valley being changed from it's current zoning to MX Heavy Industry zone. We understand that if the current zoning is changed to MX Heavy Industry all restrictions will be lifted in this area.

In a MX Heavy Industry zone there are no restrictions or monitoring to be placed on the industry. The industry in question is Albiasa Solar Thermal Plant, a **so called**, renewable energy producer (electricity). Public Utilities do not have rules that the public can influence. Albiasa currently has no functioning trough system operating in the United States. They do have a very small experimental plant in **Spain**.

They have continuously changed all the water usage from minimal usage to close to 5,000 acre feet and are now currently using the number of 2,275 acre feet of water as what they will use if the plant is built. As you know a trough producing solar plant uses the second highest amount of water, just behind Atomic Energy.

1. Impacts on protected, threatened, endangered or sensitive species of animals & plants; We have seen bats, the Desert Tortoise, Mohave Green Rattlesnake, Mexican Spotted Owl, and other wildlife, the Siler Pincushion Cactus, the Fickeisen Pincushion cactus in and around the area they plan to bulldoze.

2. Impacts on migratory birds; We know Albiasa has made no provisions for covering or screening the brine ponds.

3. Impacts from noxious weeds, invasive and non-native species; With 1,400 acres bulldozed and stripped what kind of noxious weeds, invasive and non-native species will move in when all the native plants have been striped? (Bulldozed)

4. Impacts on recreation and transportation; They (Albiasa, the Horners) are changing and/or closing off the route of Old Hwy 93 to all the residents who currently use it!

5. Impacts on land use, wilderness, farmland, and areas of Critical Environmental Concerns; They (Albiasa/ Horners) plan on altering the whole landscape, which includes washes, roads, and migratory pathways (i.e. deer & elk). They will be pumping water at an exorbitant rate. They will have the 1,400 acres lighted, large cooling towers (over 45feet). They are planning on running new power lines to the existing lines, (Western) we have been told they can not handle any additional power added to the existing power lines.

6. Impacts on culture or historic resources and tribal valves; As far as culture aspect goes we have Indian Reservations in the area and part of my culture over the last 20 years has been to live in a narrow rural valley, unaffected by modern society. My culture has been to enjoy the wide open spaces with wildlife, fona, and flora.

7. Impacts on human health and safety; With a narrow two lane highway (93 So.) at the exit (Hidden Valley) to my residence it will be a major traffic hazard and very dangerous to my health and safety, and to any other residents that use that exit there. If the, **so called**, many jobs do appear after the construction, in the meantime, during construction the heavy equipment, operators, service personnel will differently be a traffic hazard in the present. In the future we will have the traffic of the people working at and servicing the heavy industry utility. In the present and the future we will have noise, ,air pollution, and un normally high traffic in the area permanently.

8. Impacts on air, soil, and water resources (including air quality and surface water impacts); As stated earlier in items #2, #3, #5, #7, and this item, we would like to add bulldozing 1,400 acres with no natural ground. What are the chances of having a run off problem with 1,400 acres? We think the chances are very high (with 1,400 leveled acres) of having a problem and are very probable! As far as the water usage goes, it was 1,400 gallons per minute. As it stands Albiasa keeps changing the water usage rate. We don't know for sure what the water depletion will be. We do know the water table will be lowered and when the residential wells go dry no one will be responsible or accountable. A large amount of the water they will be using will be turned into steam and vented into our air.

9. Visual impacts; 1,400 acres of mirrored trough, high cooling towers, pipes, lights, traffic and noise, will stick out like a sore thumb in our narrow rural valley. Albiasa says it will be an Attraction, the residents know it will be a very large (1,400 acre) eye sore.

10. Socio-economic impacts and disproportionately high and adverse impacts to minority and low-income populations; We are of fixed low-income and are senior citizens. This is to say we are seniors amongst many in the area. To have this happen to us is much worse than a natural disaster, because this insertion of a Heavy Industry utility, in our narrow rural valley, could, can and should be prevented! Our property valves will be decreased for all the residents of the area. We have saved and sacrificed to build and reside in our narrow rural valley.

Please stop Albiasa and the zone chage to MX Heavy Industry.

Respectfully,

John Lutenske
11290E Sandriver Ranch Road
Kingman, AZ 86401
(512) 557-5820

September 30, 2009

Ms. Mary Barger
NEPA document Manager
Western Area Power Admin.
Desert Southwest Region
PO Box 6457
615 So. 43rd. Ave.
Phoenix AZ 85005

Dear Ms. Barger,

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Please stop Albiasa and the zone chage to MX Heavy Industry.

Respectfully,

Jill Lutenske

Jill Lutenske
11290E Sandriver Ranch Road
Kingman, AZ 86401
(512) 585-1970

October 16, 2009

Ms. Mary Barger
Western Area Power Administration
Po Box 6457
Phoenix, AZ 85005

The following are some thoughts on the Hualapai Valley Solar Project.

We feel that Best Available Current Technology {B.A.C.T.} should be used for all resources, especially water as there is no substitute for water! An allotment of water should not be able to be transferred from one purpose to another without reconsideration! Example, a developer gets water adequacy to build 1500 homes, decides not to build, and transfers the adequacy report for something commercial or industrial. This is wrong! They can produce electricity without using wet cooling. Its simple, dry cooling and or hybrid cooling is viable and is currently being used. A quote by Richard Rushford pretty well sums it up. "In Arizona, growth, electricity and water resources are inextricably tied! Water is by far the most limiting factor in Arizona and it's needed for human consumptive uses as well as electrical generation. Conversely, electricity poses the problem of limiting water availability. To balance these factors, power plants must generate electricity in the most water efficient manner possible to provide for continued and increased municipal and industrial water and electrical demand. This will have the effect of liberating thousands of acre feet to be used for municipal, industrial and environmental uses while still allowing room for growth!"
The technology they are using is not B.A.C.T.! As a matter of fact, this is truly old and outdated machinery and has been around for many years. Yes, it works, but at whose expense?
The footprint of this solar plant is absurd. It can and will affect every living thing in this general area. What is the effect on the environment, and what about the heat footprint and what does this heat do to the environment? The pollution created will be light as the power plant will be manned 24/7. There will be noise pollution, turbines running till midnight or longer. THIS IS NOT RENEWABLE ENERGY; IT TRADES ONE RESOURCE FOR ANOTHER.!
For what truly few jobs are going to be created, is it worth destroying this whole area for many years to come due to water shortages, no property values as nobody wants to live near this. Do we truly need this solar plant? I would think that it should need to provide some sort of benefit to the county and surrounding area; instead it is harming the area and its citizens. Put simply, this plan is nothing less than a transfer of wealth and a privatization of an extremely important public resource! Please deny this request, it is the wrong way for this state to go!

Respectfully,

Wayne E. Smith Sandra L. Smith

Wayne E. Smith & Sandra L. Smith
2752 S Calle Marco Way
Kingman, AZ 86401

Jan Bush

From: Val Starr [svsinc@live.com]
Sent: Friday, October 16, 2009 5:23 PM
To: Mary Barger
Subject: Extension

J. KANELOS
PG 1 OF 4

5018 W Oatman Road
Golden Valley, AZ 86413
Tel: (928) 565-3132
Email:svsinc@live.com

October 16, 2009

Mary E. Barger
Environmental Specialist
Desert Southwest Region
615 S 43rd Ave
PO Box 6457
Phoenix, AZ 85005-6457

Dear Mary:

I have been in contact with several groups, organizations, and government entities… who have expressed to me that they are deeply concerned with the data being provided by Hualapai Solar, and would like to see an extension of time for final filing of comments on the EIS for this project. There are "real concerns" with water usage and availability, considering a new report from the U.S. Geologic Survey for the affected area, as well as "health & welfare" issues. Other areas of concern are property values vs benefit. The cost vs benefit covers overlapping issues of land use, land rights, water rights, and use of government funding (state and federal) to accommodate a totally "private enterprise" project.

I will be sending you more specific issues, with associated documents the first of the week. You should also be receiving e-mails from several other persons and organizations. We all feel that for a project of this size $1 Billion +, it is necessary to error on the side of caution, considering the project planners and developers have stated clearly that "taxpayer dollars" are their primary source of project financing.

Thank you for your time.
Sacramento Valley Services, Inc.,

Jim Kanelos

Vice President – Government Liaison
The Water Guy

Sacramento Valley Services, Inc.
"Quality water now and for the future"
Tel: (982) 565-3132

J. KANELOS
PG 2 OF 4

Hotmail: Powerful Free email with security by Microsoft. Get it now.

J. KANELOS
PG 3 OF 4

Jim Kanelos
4402 W Oatman Hwy
Golden Valley, AZ 86413

October 19, 2009

Mary E. Barger
Desert Southwest Region
615 S 43rd Ave
PO Box 6457
Phoenix, AZ 85005-6457

RE: Hualapai Solar

Some of the issues that need to be considered within the EIS Scoping, as required by federal rules from the EPA involve the capability of the "applicant" company to comply with state statutes (See Attached) where they are seeking funding from "taxpayer dollars", involving federal grants to the states. The applicant has publicly stated that much, if not most of their funding is expected to come from both "federal" and "state" grants. This automatically triggers requirements on behalf of the "applicant" to demonstrate the ability to perform and complete the required "project" with the guidelines of CCR companies. It further requires that ALL employees be paid in accord with "prevailing wages".

Thus said, of a primary concern is "Cost vs Benefit". The existence of the solar generating plants, by statement has a life expectancy of 30 years. The construction on the plant will have a last impact on the community and the area far exceeding the "life expectancy", affect property values, in particular residential values. The water usage will also have a deter mental affect on the Hualapai Aqua Fir Basin, that currently is "recharging" at U.S. Geological Survey indicated rate of only 4,000 acre feet per year. The requested water allocation for the project is 4,000 acre feet per year, without consideration of current local residential expansion, and projected commercial-industrial demand needs. This is tantamount to "water mining", and is a major factor on the "environment", the Hualapai Basin in currently under "drought" conditions, creating a potential health & welfare problem for all users of the basin, including the City of Kingman. The projected cost of the project close to $1 billion, does not support a similar benefit to the community, over the projected 30 year life expectancy of the project. The "applicant" can not demonstrate any substantial benefit come close to the cost factors, including generated tax revenue to either the community, state, nor federal governments. The "applicants" statements that after construction they will attempt to "sell the facility", is typical action by the major principals in the company, and demonstrates a non-compliance attitude... the principals past history in evidence.

The State of Arizona, and the Federal Government "require" "state of the art" technology. The plans as presented by the "applicant" are far from "state of the art" using German designed/manufacture equipment of circa 1980's technology. Please compare to current technology available (suggested readings from the weekly newsletters of the American Solar

Energy Society) in particular articles on "dated technology" being surplused out by European manufacturers.

The "applicant engineers" stated to the Mohave County Planning & Zoning Commission on Oct. 17, 2009 that "dry cooling", nor "hybrid-cooling" technology was NOT yet available for trough thermal solar generation plants. This is a flat lie. Such technology has been developed, and is in usage in both Europe, China and the United States. We the citizens of Mohave County expect the EIS to reflect the "true nature" of current technology, and demand that the "applicant" prove by resource and data that they are compliant with same.

As noted in my e-mail, there have several individuals, groups and organizations which have just recently become aware of the Scoping process for this project, and need time to properly analyze the project as stated by the "applicant" to provide definitive data, and response to same. An extension of time for 90 days would seem reasonable, considering the finality of a Scoping determination and its impact on the community, county, state and federal resources both practical and financial.

The generation demands for electric power at reasonable cost bids, in currently low, as demonstrated by the demand response electric sales of the Griffith Energy Plant, also located in Mohave County. Granting the accepted variances in demands, and inability to project future demands the "applicant" can not demonstrate a substantial market for the energy they are proposing to generate, nor a cost-sales equation to justify the cost base of their project, even if state, and federal subsidies were implemented.

The "applicant" should demonstrate a marketability for the energy they propose to produce, at a cost effect, completive base with other grid suppliers.

There are numerous solar ventures across the nation that have used "tax incentive" dollars only to be abandoned. Don't allow this to be one of them.

Most sincerely yours,

Jim Kanelos

Jim Kanelos
Vice President Sacramento Valley Services, Inc.
Master Watershed Steward
The Water Guy

Founded 1972
STARR ORGANIZATION™ L.L.C.

5018 W Oatman Road
Golden Valley, AZ 86413-7624
Tel: (928) 565-3132

October 19, 2009

Mary E. Barger
Desert Southwest Region
615 S 43rd Ave
PO Box 6457
Phoenix, AZ 85005-6457

RE: Hualapai Solar

Dear Ms. Barger:

The Starr Organization is a tax accounting and business management firm, representing several landowners in close proximity to the proposed "Hualapai Solar Power Generation" facility. We have been casually monitoring the public hearings and Scoping process of this project. We are deeply concerned by the "property value impact" of our clients should this project be approved. On consultation with our "real estate advisors", we see a dramatic "loss of value" from the implementation and construction of this facility.

It is difficult to determine the extent of financial loss in value, considering the current down trend in the housing and land market values, but it will be substantial. We would ask that at time extension be granted for the Scoping final submission date, to allow us time to reasonably calculate the projected "financial losses", so that they may be applied to the "Cost/Benefit" factors in your Scoping process. We suggest an extension of 60+ days.

Thank you for your time and consideration.

Respectfully yours,
Starr Organization, LLC

Val H. Starr
Manager – Senior Accountant

Nell Jones
4610 N Sundown
Golden Valley Az 86413-7551

October 19, 2009

Mary E Barger
Desert Southwest Region
615 S 43rd Ave.
P.O. Box 6457
Phoenix, Az 85005-6457

I am a resident of Mohave County and am concerned the letter of intent by the city of Kingman to provide effluent water to Hualapai Solar project is not a contract. Without a contract it is not guaranteed.

The delivery system for this water is going to be very expensive, who will be expected to pay for this?

I understand they have not completed their feasibility study at this time, if this does not prove to be feasible Then they will want to use ground water. We need our ground water for the future.

If ground water is used it should be dry cooled/hybrid to conserve ground water consumption. Dry cool/hybrid has been shown to be possible in our climate. If sustainable growth is to be maintained in Mohave County We need dry cooled hybrid to be used.

Thank you
Nell Jones

From: Susan Jordan
To: HVSolarEIS@WAPA.gov
Sent: October 20, 2009
Subject: Opposition to Hualapai Valley Solar/Mohave Sun

I am opposed to the approval of Hualapai Valley Solar for many reasons.

No metering of water usage.

They would be using wet instead of dry cooling. Even dry cooling will be antiquated in a few years.

How is the effluent water pipeline going to paid for, is there a bond?

The effects of the brine ponds on the flora and fauna, should there be an overflow from the monsoons.

Susan Jordan
Secretary
Hwy93AGS
10644 Blue Dog Rd.
Kingman, AZ 86401

Jan Bush

From: Val Starr [svsinc@live.com]
Sent: Friday, October 23, 2009 7:31 AM
To: 'Mary Barger'; 'Kristin Mayes'
Subject: Mohave County Drought
Attachments: LDIG annual report 2009[1].doc

J. KANELOS (2)
PG 1 OF 2

See attached for drought conditions.

Jim Kanelos
The Water Guy
Sacramento Valley Services, Inc.
"Quality water now and for the future"
Tel: (982) 565-3132

Windows 7: It helps you do more. Explore Windows 7.

J. KANELOS (2)
PG 2 OF 2

Mohave County Local Drought Impact Group
Annual Report 2009

Introduction. This report summarizes the Local Drought Impact Group Activities conducted in Mohave County in 2009. Quarterly LDIG meetings were held in January, April, July, and October. Drought Status reports and informational presentations were provided at the meetings by various agencies and groups, including the State Forester's Office, Arizona Game and Fish, the Bureau of Land Management, the University of Arizona, water providers, local ranchers, and others. In March, 2009, the Monitoring Workgroup started meeting on a regular basis. This workgroup has developed variations of the standard Drought Impact Reporting System report form aimed at specific population segments to provide an option for those who cannot or do not want to provide impact information online. Although the LDIG is actively encouraging online reporting, reporters can also provide information to the Monitoring Workgroup via hard copy forms so the info can be reported online by the Workgroup or LDIG Secretary. The Monitoring Workgroup is identifying and reaching out to potential reporters to fill geographical gaps in the county reporting network.

Status of Drought. Drought conditions continue and have significantly worsened since the failure of the monsoon to produce significant rainfall after June, 2009. Due to the spotty nature of the earlier rainfall, some isolated areas' conditions are not as severe as in other areas, but the great bulk of the county's land area is seeing severe drought conditions. Precipitation amounts reported from various agencies and reporting stations are indicating annual precipitation amounts ranging from one third to two thirds of normal, with 50% of normal being an estimated average. Since much of this rainfall occurred in the first three months of the year and not during the spring or summer, the averages do not adequately reflect the recent lack of rainfall.

Drought Impacts. Current reporting from ranchers, the BLM, and others has indicated severe impacts on vegetation in areas throughout the county. Water tanks in all areas have dried up, and ranchers in the Arizona Strip area (northern Mohave County) are hauling water. Lack of tank water will severely impact wildlife as well as livestock. Livestock forage loss is estimated at over 50% throughout the county, and livestock population numbers in the Strip area are running at 50-75% of normal. Some local springs have been drying up, and Lake Mead's water elevation has fallen 19', with only 18' remaining prior to the automatic initiation of cutbacks in water supply outtakes from the Colorado River. The necessity for a declaration of drought emergency this area of the state is already becoming apparent.

Drought Related Actions. Currently, none of the cities have implemented any of their drought plan stages. The cities, NRCS and BLM offices, State Forestry, Game and Fish, and other agencies will be contacted regularly by the LDIG for drought impact reports, drought stage implementation, and actual or proposed mitigation measures. This information will be utilized by the Mitigation Working Group, which will continue to recruit additional impact reporters and develop a more extensive system of monitoring with regular reports into the Drought Impact Reporting System. Discussions will be initiated on the need to establish Mitigation and Public Outreach Planning Workgroups in view of the worsening drought situation. Efforts to date have been focused exclusively on establishing and building the Monitoring Workgroup.

Jan Bush

J. KANELOS (3)
PG 1 OF 2

From: Val Starr [svsinc@live.com]
Sent: Friday, October 23, 2009 4:08 PM
To: 'Mary Barger'
Subject: Hualapai Solar Project
Attachments: BLM Ltr Ground Water.jpg

Susan Bayer gave me this letter from the U.S.Geological Survey... I don't know if she sent you a copy. However I do know that SVS talked with Rubin Sanchez, Regional Dir. for the BLM, last Friday (Oct. 16) who stated that they had not yet taken a position on the Hualapai Solar Project, and didn't see a report forthcoming for several weeks at least. I think the people would like to see what the BLM has to say on the subject... they have engineers and specialists to make very informed tech statements.

Jim Kanelos
The Water Guy

Sacramento Valley Services, Inc.
"Quality water now and for the future"
Tel: (982) 565-3132

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J. KANELOS (3)
PG 2 OF 2

United States Department of the Interior

U.S. GEOLOGICAL SURVEY

Arizona Water Science Center
Flagstaff Programs Office
2255 North Gemini Drive
Flagstaff AZ 86001

September 1, 2009

Susan Bayer
7656 West Abrigo Drive
Golden Valley, AZ 86413

Dear Ms. Bayer,

The purpose of this letter is to provide clarification on some questions you conveyed on our phone conversation August 31 regarding U.S. Geological Survey Scientific Investigations Report 2007-5182 "Ground-water occurrence and movement, 2006, and water-level changes in the Detrital, Hualapai, and Sacramento Valley Basins, Mohave County, Arizona" by David W. Anning, Margot Truini, Marilyn E. Flynn, and William H. Remick. This report has gone through the peer review process and was approved by the USGS on Aug. 28, 2007. The report is available in hardcopy and in digital form on the World Wide Web at http://pubs.usgs.gov/sir/2007/5182. The report is considered final; however, in accordance with USGS report policy, any erratum or updates needed for this report will be incorporated into the online copy of the report. As of today, both the printed and electronic copies of the report are the same because there have not been any erratum or updates to the report.

Regarding your concerns of aquifer depletion, the section "Long-term water-level changes" (pages 6-12) discusses areas in the Detrital, Hualapai, and Sacramento Valleys where the groundwater levels have fluctuated over time in response to groundwater recharge or groundwater depletion. The report shows several areas in each of the three basins where water-level rises have occurred during the past several decades as a result of aquifer recharge, as well as other areas where significant water-level declines were observed, such as an area along Truxton Wash near Hackberry, an area northeast of Kingman, and an area in Golden Valley. These three areas of noted decline represent areas where ground-water pumpage has depleted the aquifer. The report, however, does not include a computation of the volume of such groundwater depletions from pumpage or additions from recharge, nor was any comparison made of these changes to the total volume of groundwater available in storage.

Sincerely,

David Anning
Hydrologist

Jan Bush

From: Val Starr [svsinc@live.com]
Sent: Friday, October 23, 2009 2:49 PM
To: 'Mary Barger'

Hi Mary
Did you get the three packages I sent in the mail for the Hualapai Solar Scoping? How does it look for a time extension?

Jim Kanelos
The Water Guy
Sacramento Valley Services, Inc.
"Quality water now and for the future"
Tel: (982) 565-3132

Windows 7: It works the way you want. Learn more.

SIERRA CLUB
FOUNDED 1892

Grand Canyon Chapter • 202 E. McDowell Rd, Ste 277 • Phoenix, AZ 85004
Phone: (602) 253-8633 Fax: (602) 258-6533 Email: grand.canyon.chapter@sierraclub.org

October 23, 2009

Western Area Power Administration
Attn: Mary Barger
P.O. Box 6457
Phoenix, AZ 85005
HVSolar@wapa.gov

Re: Scoping Comments on the Hualapai Valley Solar Project

Dear Ms. Barger:

Please accept and fully consider these comments on the Hualapai Valley Solar Project on behalf of the Sierra Club's Grand Canyon (Arizona) Chapter.

The Sierra Club is a non-profit, public interest environmental organization with over 700,000 members, 12,000 of which reside in Arizona, whose mission is to explore, enjoy and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environment. Sierra Club has a strong interest in protecting Arizona's land and water as well as promoting clean renewable energy and energy efficiency. The Sierra Club also has a significant interest in public lands and the potential impacts of the transmission line on those lands.

Background

The threats posed by global climate change are unprecedented. Never before have we faced such an enormous planet-wide problem. It is clear that to protect our communities, our wildlands and wildlife, we must quickly transition away from fossil fuels to clean renewable energy and energy efficiency programs. We must eliminate energy waste; moderate demand through energy efficiency, conservation, and demand-side management practices; and rapidly develop and deploy clean, renewable energy technologies, including at the utility-scale.

Our public lands harbor substantial wind, solar, and geothermal resources. Developing some of these resources and the associated transmission will be important to creating a sustainable energy economy and combating climate change, and we support such responsible development of renewable energy. Renewable resource development and transmission is not appropriate everywhere on the public lands, however, and development that does occur on the public lands must take place in a responsible manner. We think it is most appropriate to seek disturbed sites or sites where the facility and the associated lines will have limited disturbance and where the facility will not result in a net increase in water use.

As environmental advocates analyzing the need for new transmission and related facilities, our job is to ensure that:

- any new transmission built is truly needed,

- new transmission minimizes local and regional environmental impacts,
- utilities expend significant resources developing efficiency and distributed generation so as to minimize the need for new transmission, and
- new transmission purported to carry renewable energy must not instead turn out to be a major conduit for coal power.

We think you should look at some of those same factors relative to the proposed transmission lines for this project. In addition to that, your National Environmental Policy Act analysis of this project must include the overall impact of the project, including the cumulative impacts. You must look at the impacts to biological, cultural, and water resources, among other issues.

Impacts of transmission lines and related facilities

Transmission lines can have serious environmental impacts. Poorly sited, they may interfere with wildlife corridors, damage wetlands or other water sources, degrade culturally important lands, and cause other damage. They also have visual impacts. This is important in iconic places, most of which already prohibit transmission, such as national parks and wilderness areas.

Numerous impacts may result from construction, utilization and maintenance of new transmission, including larger substations. Transmission lines include construction of tall towers and extensive power lines. They require roads both for construction and maintenance. In areas with vegetative cover including deserts, scrub and forests, utilities frequently remove all vegetation under powerlines using herbicides. New standards for reliability of lines have caused some utilities to remove large amounts of vegetation underneath lines.

The following is not an exhaustive list but includes some of the issues you should evaluate relative to potential environmental impacts from these new transmission proposals.

- Damage or loss of habitat for plants and wildlife, including sensitive, threatened and endangered species from construction and maintenance of towers and roads.
- Impacts may include removal of extensive areas of habitat to keep vegetative clearance under powerlines.
- Significant air quality impacts can occur during construction through use of heavy equipment and their emissions as well as fugitive dust emissions.
- Soils may become eroded or compacted through construction, which can impact water quality as well as habitats of numerous species.
- Drainage patterns may be altered by construction of towers and roads.
- Indirect impacts from increased access to lands near powerlines, such as increased illegal off-road vehicle use, can damage multiple resources.
- Cultural, historic, and paleontological resources may be impacted by transmission construction and operation.
- Roads and other intrusions can increase the spread of noxious weeds.

Resource Concerns and the Proposed Facility

There are number of significant resources on the site that require an in-depth analysis of the impacts of the proposed project and development of a comprehensive impacts minimization and mitigation strategy.

A. Biological Resources

What wildlife species are in the area and will be affected by both the project and the proposed transmission? Are there desert tortoises in the project area? If so, impacts of the project on the tortoises should be thoroughly evaluated and minimized. Are there any threatened or endangered species? If so, the impacts must be analyzed. An alternative that minimizes impacts on native plants and wildlife should be developed.

B. Cultural Resources

WAPA must adequately evaluate the environmental consequences of the proposed project on historic resources. The NEPA regulations recognize that impacts to cultural resources such as historic properties and "scientific resources" can comprise a significant impact on the environment. 40 CFR 1508.27(b)(3),(8). Additionally, WAPA must analyze the direct, indirect, and cumulative impact of each alternative on areas of importance to local tribes and areas of high cultural site density.

C. Soil Resources

Impacts to soil resources are one of the most challenging issues for solar projects proposed in the desert. As seen in the ongoing permitting process for the proposed Ivanpah Solar Energy Generating System in California, development of adequate drainage, erosion, and sediment control plans is a complicated, time consuming, and challenging task. Desert soils are particularly fragile and development can have significant impact on the cryptogrammic crust, which is primarily made up of cyanobacteria, mosses, and lichens. When these soils are disturbed, the desert land generates more dust and the area is more susceptible to invasive plant species.

D. Water Resources

Water is a limited resource in the desert southwest, and any project proposal should fully analyze the water needs and identify sources to meet those needs.

Since Hualapai Valley Solar LLC is proposing a wet-cooled system in a desert environment, we are concerned about the project's water use. According to the company's website, the project will use between 2000 and 3000 acre-feet of water annually. This is a significant amount of water in such an arid land.

The NEPA analysis should include information on how much water the plant is expected to use on an annual basis, where the company will obtain the water, and the impacts of using that water. It should also include any information on how the plant proposes to reuse its water and manage its waste stream.

A less water-intensive system that does not add significantly to the cost of generating electricity should be considered and analyzed in the NEPA process.[1] WAPA should analyze alternatives that use hybrid or dry cooled systems to determine whether these options may be technically and economically viable and could minimize potential impacts to water resources and other related environmental impacts.

Conclusion

Again, the Sierra Club is supportive of developing renewable energy to help meet the needs of our communities in a manner that reduces greenhouse gas emissions that contribute to global warming. We want to ensure that these facilities are well-sited and that adverse impacts are minimized, however. Overall, it appears there are many positive aspects to the site location, the biggest issue relative to this proposed project is the amount of water it will use in a place that has so little.

Thank you for your consideration of these comments.

Sincerely,

Sandy Bahr
Chapter Director
Sierra Club - Grand Canyon Chapter
202 E. McDowell Rd, Suite 277
Phoenix, AZ 85004

[1] See for example: *Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation*, Report to Congress, U.S. Department of Energy (no date of publication).

Jan Bush

From: Val Starr [svsinc@live.com]
Sent: Friday, October 30, 2009 2:26 PM
To: Mary Barger; Jack Ehrhardt
Subject: Hualapai Solar Power

J. KANELOS
PG 1 OF 2

Hello Mary:

This is one of the reasons we wanted an extension of time… on Oct. 28th, the City of Kingman had a public meeting: [Topic-City of Kingman Effluent Water Sale to Hualapai Power].

Not one representative of Hualapai Solar attended the meeting. The Mayor of Kingman and his staff took questions from the public on this topic. The Mayor stated that a "letter of intent" was issued by the City to Hualapai Solar, but has not been responded to by Hualapai Solar. There is no CONTRACT with the city to buy the effluent. According to representatives of the Lower Colorado River Resource and Development Council (LCRRC&DC), on October 23, (Public Non-Profit 501c(3), the city of Kingman will be required to install and maintain a 1.3 million gallon, Class "A" water effluent storage tank, at the cities expense, confirmed by the Mayor Mr. Salem, which has NOT been allocated, nor approved by the City Council at this time. LCRRC&DC, believes that the City of Kingman, can not afford such an infrastructure without a local "bond imitative", that is NOT likely, considering the current national financial, and local status for tax payers. [Cost vs. Benefit]. Further a "pipe line" for said effluent would need to run approximately 28 miles to the Hualapai Solar facility… as this would access county lands, payment fees for "utility" right of way would be charged starting the first day, access to the "right of way" is used, payable on an annual basis. If crossing "private lands", fees would have to be negotiated. In either case, Hualapai Solar, has not demonstrated by either "financial statements", nor "credit history" that they could afford such start up costs, without substantial backing, not yet provided.

As they, are content with what they seem as "water allocations" from the proposed four (4) wells, they believe they don't need the effluent water source from the city. Thus jeopardizing the aqua fir. While there is an indication that the replenishment of the Hualapai Aqua Fir, is gradually increasing (4,000 year watershed projections), a five-year definitive flow valuation has not yet been established… 2005 to 2009, is not conclusive. It is clear that the "water table" is dropping, and that Hualapai Power will engage in "water farming" at this point in time.

As previously noted, the primaries of Hualapai Solar have a poor track record with local area, and the federal government on their projects, which must be considered.

Thank you for your time, and consideration.

James Kanelos
The Water Guy
Vice President Sacramento Valley Services, Inc
Arizona Master Watershed Steward
Vice Chairman Hwy 93 North Area Plan Committee
Member LCRRC&DC
Member Northwest Arizona Watershed Council
Member Arizona Geological Society
Member Arizona Hydrological Society

Member Arizona Water Resources & Research Council
Member Mohave County Local Drought Impact Group
Advisor Western States Constutionalist Alliance, Inc;.
etc.

Sacramento Valley Services, Inc.
"Quality water now and for the future"
Tel: (982) 565-3132

J. KANELOS
PG 2 OF 2

Windows 7: It helps you do more. Explore Windows 7.

WESTERN AREA POWER ADMINISTRATION- AUTHORITY FOR E.I.S.

Project proposed: 340 mega watt Hualapai Valley Solar- solar concentrated, full water cooled power plant. Mohave County Arizona. Public comments, October 1 2009 Kingman Arizona.

HOW CAN ANYONE STEAL OUR WATER?

Systematically our limited water resources in Arizona are being depleted and not recharged because of the effects of drought and related climate change influences. This effect , drought, does not currently have a federal designation for its emergency status for extinction as wildlife does, but it should. For some reason Federal Agencies have not ranked this mandatory life element as having enough relevance to give its existence status as having a quantifiable value, for its true value that it is, thus giving its use a significant evaluation. W.A.P.A. should not simply take a line item in the E.I.S.and talk about water use in general terms like so many E.I.S. documents do, but instead should do a full life embodied energy analysis of the waters use for comparison to understand the loss value of local water if the power plant is allowed to be full wet cooled, versus the value of saving the local water to support the local domestic and economic development of the community. Allowing the power plant to use local water supply depletes the local resource that is irreplaceable. Then give a intrinsic dollar value to that. This then can be evaluated against the increased local county tax base and job wage benefit over the life of the plant for 30 years. I would venture the local water use value exceeds its commercial use for the proponent that will go up and be wasted in useless steam ,but make profit for the proponent in their export of this power.

Dry cooled or hybrid cooled is obviously the only choice State and Federal Agencies can allow tp be approved in the review of these concentrated solar power plants. Everyone wants renewable energy power plants, but this is not a full renewable energy power plant unless it is NOT DEPLETING A NATURAL RESOURCE. The report by the U.S. Department of Energy---Reducing water consumption of Concentrating Solar Power Electrical Generation, Report to Congress , clearly explains the benefit and practicality of the dry cooled system of saving water...this is using B.A.C.T.—Best Current Available Technology. There is no good argument that this is not viable under any circumstances. The proponent himself has had an Internet posting where he spoke for approximately 30 minutes about this project and how it will have Federal Tax dollars to build it, that amount to free money. 30 plus percent in U.S.free grant money and the rest at some 3% Federal loan. This use of Federal U.S. Tax Dollars requires the use of B.A.C.T. and the preservation of our groundwater, a vital natural resource when it is not necessary to use it. In that 30 minute speech the proponent only spoke about how great his project was and never about water use and it contentious concern. W.A.P.A. has historically been the leader in renewable energy with its hydro electric Dam facilities throughout the west and now it is time to face up to the fact that if a energy project wants to build in the dry desert west, they have to tell the proponent you can't have it all. You simply can't take the water when you don't have to and either go where there is abundant water or build your power plant dry cooled.....How can anyone steal our water, only if you let them..... Jack Ehrhardt-4105 N. Adams St Kingman Az.86409--9287574202

Jack Ehrhardt

If you Keep your Technology the Same and the environment changes and you don't change you won't survive.

Last Name*: Ehrhardt First Name: Jack

Mailing Address*: 4105 N. Adams St.

City, State, Zip*: Kingman Az. 86409

HUALAPAI VALLEY SOLAR PROJECT

WE WELCOME YOUR COMMENTS

Your comments will help Western Area Power Administration define issues and alternatives for the proposed project. Please provide your comments in the space below, fold on the recommended lines, tape closed, and affix the proper postage. Please provide comments by **October 23, 2009.**

Mail comments to:
Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment –including your personal identifying information –may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Last Name: Bayer First Name: Susan

Organization (if applicable) :

Mailing Address: 7656 W. Abrigo Drive

City, State, Zip: Golden Valley, AZ 86413

E-mail Address (optional): rbbdci@frontiernet.net

Comments: I have attached a copy of the letter of intent. betw the City of Kingman and Hualapi Valley Solar. It is dated 2/6/2009, the Public meetings began the end of July 2009. It is for the possible use of effluent in reducing the use of water by Hualapi Solar. I wish to point out this letter of intent is not a binding agreement. I ask that you do not approve this application unless Hualapi Solar presents a legally signed contract with the City of Kingman. this contract should include all specifics such as the sale break down of the effluent and the pump's, and the piping of such effluent.

Again a letter of intent is nothing valid, it is nothing but a piece of paper.

Please indicate how you would like to be informed in the future about this project:

- [x] Yes [ ] No I wish to remain on the mailing list for this project (*provide name and address*)
- [ ] Yes [ ] No Please send me information by regular mail only (*provide name and address*)
- [x] Yes [ ] No Please send me information by e-mail (*provide email address*)

S. BAYER
PG 2 OF 2

CITY OF KINGMAN, ARIZONA
June 26, 2009

HUALAPAI VALLEY SOLAR LLC
Attention: Greg Bartlett, Managing Director
2701 East Andy Devine Avenue – Suite 300
Kingman AZ 86401
T: 206.349.6068 F: 309.407.1598 / greg@hualapaivalleysolar.com

RE: LETTER OF INTENT FOR THE USE OF EFFLUENT FROM THE HILLTOP WASTEWATER TREATMENT PLANT

Dear Mr. Bartlett:

Hualapai Valley Solar LLC ("HVS") and the City of Kingman ("City") share a common goal: to reuse the effluent created by the City's new Hilltop Wastewater Treatment Plant ("Hilltop").

The purpose of this non-binding Letter of Intent ("LOI") is to summarize our discussions to date and to confirm our respective intentions with respect to future collaborative investigations that may result in a possible future transaction.

1. HVS intends to build and operate a solar thermal power plant ("Power Plant") on private land it has acquired approximately 27 miles north of Kingman. The Power Plant is subject to obtaining required permits and approvals at the federal, state and local level.
2. The Power Plant requires water for both construction and normal operation. Rather than rely on on-site, treated groundwater from the Hualapai Valley Aquifer, HVS could possibly use effluent (treated wastewater) from Hilltop.
3. The City would like to find a productive use of the effluent produced by the new Hilltop Wastewater Treatment Plant (5925 E. Highway 66).
4. HVS has been considering the use of Hilltop effluent for its project. Investigative meetings and discussions have been conducted with the City water department, independent power plant consultants and wastewater experts, and the engineering firm designing the Power Plant.
5. This document is a Letter of Intent to only. It is not intended to be, and shall not constitute in any way, a binding or legal agreement, or impose any legal obligation or duty on either party, until a final, definitive Agreement is negotiated and executed.
6. In no event does this LOI restrict the City from exploring options with other entities or other uses.

Based on the foregoing intentions and expectations, the parties agree as to work together in a collaborative arrangement to further investigate the technical and financial feasibility of delivering Hilltop's effluent (or a portion thereof) to HVS for use in its Power Plant project.

Very truly yours,

MAYOR JOHN SALEM
CITY OF KINGMAN, ARIZONA

City of Kingman

John Salem, Mayor of Kingman

Hualapai Valley Solar LLC

Greg Bartlett, Managing Director

HUALAPAI VALLEY SOLAR PROJECT

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ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

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Last Name: Black First Name: Janella M. Black.

Organization (if applicable): Dolan Springs Community Council

Mailing Address: P.O. Box 739

City, State, Zip: Dolan Springs, Az. 86441

E-mail Address (optional):

Comments: Being a resident of Dolan Springs and a Member of the Community Council Board of Directors, I have great Concerns regarding any project that could affect our Water supply. Our Water Comes from the Red River and that is the Cause of my Concern. I am not sure if all of the Residents are aware of this, so Maybe this is an issue that should be placed on the ballot for the next election.

I am opposed to this project for our area.

Please indicate how you would like to be informed in the future about this project:

- [X] Yes [ ] No I wish to remain on the mailing list for this project (*provide name and address*)
- [X] Yes [ ] No Please send me information by regular mail only (*provide name and address*)
- [ ] Yes [ ] No Please send me information by e-mail (*provide email address*)

HUALAPAI VALLEY SOLAR PROJECT

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P.O. Box 6457
Phoenix, Arizona 85005

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Last Name: BRAND First Name: ROBERT

Organization (if applicable) :

Mailing Address: 4450 GLEN Rd

City, State, Zip: KINGMAN AZ 86409

E-mail Address (optional): TREEBRAND @ FRONTIERNET.NET

Comments:

WHARE WILL YOU HIRE CONSTRUCTION HELP
+ PLANT EMPLOYES HOW MANY —

HOW LONG BEFORE PROJECT ~~START AND~~ BUILDING TIME.
+ FINISH BUILDING START GENERATORS

Welcome to KINGMAN — Good Luck + GOD BLESS
GLAD YOUR HERE —

Please indicate how you would like to be informed in the future about this project:

- ☑ Yes ☐ No I wish to remain on the mailing list for this project (*provide name and address*)
- ☑ Yes ☐ No Please send me information by regular mail only (*provide name and address*)
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Mail comments to:
Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Last Name: Brown First Name: David

Organization (if applicable): Arizona Antelope Foundation

Mailing Address: P.O. Box 12590

City, State, Zip: Glendale, AZ 85318

E-mail Address (optional): azantelope@cox.net

Comments: We strongly recommend the location of such sites avoid present, historic, and future pronghorn habitat. Before locating any sites for the proposed project we strongly suggest contacting the Habitat Specialist for Region III (Kingman) office of the Arizona Game & Fish Department.

Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☐Yes ☐No Please send me information by e-mail (*provide email address*)

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Last Name: CARTER First Name: Tom

Organization (if applicable) :

Mailing Address: P.O. Box 4002

City, State, Zip: KINGMAN, AZ. 86402

E-mail Address (optional):

Comments:

WHAT IS THE SOURCE OF THE SALT?

WILL ENERGY GENERATED BE DIRECTLY DELIVERED TO WAPA OR STORED?

IF STORED, WHERE & HOW?

Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☐Yes ☐No Please send me information by e-mail (*provide email address*)

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Last Name: CLARICE DAVIS First Name: A

Organization (if applicable) : AG393

Mailing Address:

City, State, Zip:

E-mail Address (optional):

Comments: DOES this Company have the MATERIALS NOW READY TO BUILD.

How MANY OF THESE PLANTS ~~[illegible]~~ OF THIS KIND ARE YOU INVOLVED IN, IN THE UNITED STATES.

What will you treat the ground with to control dust.

Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☐Yes ☐No Please send me information by e-mail (*provide email address*)

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Phoenix, Arizona 85005

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Last Name: Kanelos First Name: Jim

Organization (if applicable) :

Mailing Address: 4402 Oatman Rd.

City, State, Zip: Golden Valley AZ. 86413

E-mail Address (optional): SVSINC@live.com

Comments: There needs To be a study on how H.V.S. lower property value's around this project, H.V.S should use Dry cooling or Hybrid cooling per the Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation Report to Congress by U.S. Department of Energy, There needs To be a study on Endanger animals and plants.

Please indicate how you would like to be informed in the future about this project:

- ☑ Yes ☐ No I wish to remain on the mailing list for this project (*provide name and address*)
- ☐ Yes ☐ No Please send me information by regular mail only (*provide name and address*)
- ☑ Yes ☐ No Please send me information by e-mail (*provide email address*)

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Last Name: Kanelos First Name: Jim

Organization (if applicable) : S.V.S.

Mailing Address: 4402 Oatman Rd

City, State, Zip: Golden Valley AZ 86413

E-mail Address (optional): SVSINC@live.com

Comments:

How meney wells are you dilling for water even if it is for back up water?

Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☐Yes ☐No Please send me information by e-mail (*provide email address*)

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Mail comments to:
Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Last Name: LaMastra First Name: Charles
Organization (if applicable) :
Mailing Address: 318 Jefferson Court
City, State, Zip: Limerick, PA 19468
E-mail Address (optional): blamastra@lamastragroup.com

Comments: I am not in favor of this project being located 1/4 mile from my property. I believe it would be a permanent eyesore and detract from any future favorable use and value.

I believe the project if it goes forward should incur the cost of purchasing all land within a 2-3 mile radius of its boundaries.

Sincerely

Please indicate how you would like to be informed in the future about this project:

- ☑ Yes ☐ No I wish to remain on the mailing list for this project (*provide name and address*)
- ☐ Yes ☐ No Please send me information by regular mail only (*provide name and address*)
- ☑ Yes ☐ No Please send me information by e-mail (*provide email address*)

HUALAPAI VALLEY SOLAR PROJECT

WE WELCOME YOUR COMMENTS

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Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment –including your personal identifying information –may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Last Name: MARTIN First Name: DESRA

Organization (if applicable) :

Mailing Address: 7370 E Dome Rock Dr.

City, State, Zip: Kingman AZ 86401

E-mail Address (optional):

Comments: All large scale solar facilities should be required to use technologies that do not allow for massive evaporation of water in desert areas totally dependant on groundwater - especially since these technologies do exist. Long-term sustainability of the region will succeed only if a precedent of environmental stewardship is set from the beginning.

The Environmental Director for HVS appears to be a smart man, but the word "Environmental" should be left out of his title. As so often happens, wildlife and the environment are easily left out of the equation, which tends to focus on the technical and financial aspects.

Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☐Yes ☐No Please send me information by e-mail (*provide email address*)

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Last Name: OLIPHANT First Name: MARGARET

Organization (if applicable) :

Mailing Address: 1308 N. Stockton Hill - A 279

City, State, Zip: Kingman - AZ - 86401

E-mail Address (optional):

Comments:

WHY ARE THERE NO NATIVE AMERICANS HERE

WHAT ABOUT LIGHTENING STRIKES OR ANY OTHER POSSIBILITY OF FIRES?

Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☐Yes ☐No Please send me information by e-mail (*provide email address*)

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Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

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Last Name: Rausch First Name: Earl & June

Organization (if applicable): Dolan Springs Community Center

Mailing Address: P.O. Box 355

City, State, Zip: Dolan Springs, Az 86441

E-mail Address (optional):

Comments: I am June Rausch, President of the Dolan Springs Comm. Ctr. My husband, Earl Rausch is on the Board of Directors. We are concerned of any use of water from our source of supply from Red Lake. Our water table is low already and population is still growing. What would we do if our water source is depleted?

Please indicate how you would like to be informed in the future about this project:

- ☐ Yes ☐ No I wish to remain on the mailing list for this project (*provide name and address*)
- ☑ Yes ☐ No Please send me information by regular mail only (*provide name and address*)
- ☐ Yes ☐ No Please send me information by e-mail (*provide email address*)

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Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

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Last Name: Rumney First Name: Catherine

Organization (if applicable) :

Mailing Address: 3439 N Lochiel Rd

City, State, Zip: Golden Valley AZ 86413

E-mail Address (optional): SeeCatherine@yahoo.com

Comments: It is absurd for anyone to claim that this benefits the environment when they will be using so much water that is so limited in this arid region. They need to be dry cooled only or they should go to AJO Arizona or other sunny spot with a water table that is not so vulnerable. Mohave county should not welcome anymore power plants that depend so heavily on water. Photovoltaics make more sense in this region that cannot keep up with the water supply. Our table is declining and doesn't need this demand.

Please indicate how you would like to be informed in the future about this project:

- ☑ Yes ☐ No I wish to remain on the mailing list for this project (*provide name and address*)
- ☐ Yes ☐ No Please send me information by regular mail only (*provide name and address*)
- ☑ Yes ☐ No Please send me information by e-mail (*provide email address*)

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Mail comments to:
Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Last Name: SPOTTS First Name: RICHARD

Organization (if applicable) : PRIVATE CITIZEN

Mailing Address: 1125 W. EMERALD DRIVE

City, State, Zip: ST. GEORGE UT 84770-6026

E-mail Address (optional): spotts@infowest.com

Comments:

I STRONGLY SUPPORT SOLAR ENERGY DEVELOPMENT. CLIMATE CHANGE IS REAL, AN ENORMOUS THREAT, AND WE MUST RAPIDLY TRANSITION AWAY FROM FOSSIL FUELS. WHENEVER POSSIBLE, NEW ALTERNATIVE ENERGY FACILITIES SHOULD BE LOCATED NEAR EXISTING TRANSMISSION LINES IN ALREADY DEGRADED OR FRAGMENTED AREAS. PRISTINE AND REMOTE AREAS SHOULD BE AVOIDED. RESOURCE ISSUES TO BE ANALYZED INCLUDE; MOJAVE/SONORAN DESERT TORTOISES, BIGHORN SHEEP, AND OTHER WILDLIFE SPECIES; POTENTIAL WATER CONSUMPTION AND ANY AFFECTS ON SURFACE AND/OR GROUNDWATER; CHEATGRASS AND OTHER INVASIVE/NOXIOUS WEEDS, AND WHETHER NEW ROADS SHOULD BE OPEN TO THE PUBLIC OR LIMITED TO BLM AND FACILITY EMPLOYEES. THANK YOU VERY MUCH FOR CONSIDERING MY COMMENTS.

Please indicate how you would like to be informed in the future about this project:

- ☐ Yes ☐ No I wish to remain on the mailing list for this project (*provide name and address*)
- ☐ Yes ☐ No Please send me information by regular mail only (*provide name and address*)
- ☒ Yes ☐ No Please send me information by e-mail (*provide email address*) ABOVE

HUALAPAI VALLEY SOLAR PROJECT

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Mail comments to:
Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Last Name: Watson First Name: Gary

Organization (if applicable): Mohave County, District 1

Mailing Address: PO Box 7000

City, State, Zip: Kingman, AZ 86402

E-mail Address (optional): gary.watson@co.mohave.az.us

Comments: will this include the possible PIPELINE of effluent from the City of Kingman's treatment plant?

Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☒Yes ☐No Please send me information by e-mail (*provide email address*)

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Mail comments to:
Western Area Power Administration
ATTN: Mary Barger
P.O. Box 6457
Phoenix, Arizona 85005

Last Name: [illegible] First Name: [illegible]

Organization (if applicable) : [illegible] Management

Mailing Address: [illegible]

City, State, Zip: [illegible] AZ [illegible]

E-mail Address (optional): [illegible]

Comments: [illegible]

Please indicate how you would like to be informed in the future about this project:

- ☒ Yes ☐ No I wish to remain on the mailing list for this project (*provide name and address*)
- ☐ Yes ☐ No Please send me information by regular mail only (*provide name and address*)
- ☒ Yes ☐ No Please send me information by e-mail (*provide email address*)

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Last Name: First Name:

Organization (if applicable) :

Mailing Address:

City, State, Zip:

E-mail Address (optional):

Comments:

What is the cost of the land being used?

Please indicate how you would like to be informed in the future about this project:

☐Yes ☐No I wish to remain on the mailing list for this project (*provide name and address*)
☐Yes ☐No Please send me information by regular mail only (*provide name and address*)
☐Yes ☐No Please send me information by e-mail (*provide email address*)

Jan Bush

From: HVSolar_scoping_comment@wapa.gov
Sent: Friday, September 18, 2009 12:05 PM
To: HVSolarEIS@wapa.gov
Subject: Hualapai Valley Solar Scoping Comment Form

Issues, concerns or questions : My name is tony gaffke I live in the area and I am in total support of the proposed project.
This is a the place for it, and although your map in the standard does not show the lines, there is nothing out.

tony gaffke (928) 767-3009

Mail list yes - E-mail : Yes, add me to the mailing list - e-mail

Name : tony gaffke

Representing : M.B.A. of Dolan Springs

Address : 16049 N. Mabel rd.

City : Dolan Springs

State : AZ

Zip Code : 86441.

Fax :

E-mail address : tonygaffke@frontiernet.net

Jan Bush

From: clarice davis [clarice125@live.com]
Sent: Saturday, September 19, 2009 4:59 PM
To: hvsolareis@wapa.gov
Subject: Hualapai Solar Project

My concerns are of the proposed Hualapai Valley Solar LLC aka Mohave Sun Power and/or Albiasis Solar Plants...They seem to be connected by their Company leadership .

A lot of different things have come to my attention. Probably using old equipment Probably using obscene amounts of water. Probably upsetting the natural habitat and animals.
Probably having lots of glare. Probably having lots of noise from the turbines.

And the proposed Albiasis Plant is proposing to be built in the middle of heavy residential.

All in all I do hope you take a very serious close look at these proposed plants. They do not read GREEN to me.

Thank you for your attention.

Clarice L. Davis
3073 N. Quailnest Rd.
Kingman, AZ 86401
928 692-1840

Jan Bush

From: Randy Wilkerson [Wilkerson@wapa.gov]
Sent: Monday, September 21, 2009 8:53 AM
To: Slick David P (Dave)
Cc: HVSolarEIS HVSolarEIS
Subject: Re: FW: Western news release: Public open-house meeting set for Hualapai Valley Solar Project

Dave,

The proposed Hualapai Valley Solar Project is being developed by Hualapai Valley Solar, LLC, a wholly-owned subsidiary of Mohave Sun Power LLC. The 340-MW project would use concentrating solar-power-trough technology. For more information, see the project Web site at http://www.wapa.gov/transmission/HVSolar.htm

Hope this helps. If you have other questions, just let me know. Thanks,

Randy

Randy Wilkerson
Public Affairs Specialist
Corporate Communications
Western Area Power Administration
720-962-7056

>>> "Slick David P (Dave)" <Dave.Slick@srpnet.com> 9/21/2009 9:38 AM >>>
Randy,

Are you at liberty to identify the proposed size (mw) and developer of this facility?

Thanks,
Dave Slick
Manager of Strategic Projects
Energy Management & Information
SRP

NEWS FROM WESTERN AREA POWER ADMINISTRATION

FOR IMMEDIATE RELEASE: September 16, 2009
CONTACT: Randy Wilkerson, 720-962-7056, wilkerson@wapa.gov PUBLIC OPEN-HOUSE SCOPING MEETING SET FOR HUALAPAI VALLEY SOLAR PROJECT Public invited to provide comments during environmental review phase LAKEWOOD, Colo. An open-house public meeting will be held Thursday, Oct. 1, in Kingman, Ariz., from 6 p.m. to 8 p.m.at the Kingman High School Auditorium, 4182 Bank Street, Kingman, Ariz. 86409 on the proposed Hualapai Valley Solar Project.
The Hualapai Valley Solar Project involves the construction and operation of a 4,160-acre solar power facility. Other project components include an electrical substation, a 500-kilovolt (kV) transmission line, and two access roads. The Hualapai Valley Solar Project would be located approximately 27 miles north of Kingman and 20 miles east of US 93.
The open-house meeting is part of Western Area Power Administrations effort to share information and receive public comments on the scope of issues it will evaluate in the Hualapai Valley Solar Project Environmental Impact Statement. Western, an agency of the U.S. Department of Energy, is preparing an EIS because the proposed project would interconnect with Westerns electric transmission system. The EIS will be prepared according to the

National Environmental Policy Act (NEPA). The Bureau of Land Management will be a cooperating agency.

Western invites the public to provide written comments on the scope of the EIS, including resources to be evaluated, alternatives to be considered, and significant concerns and issues. Comments on the scope of the EIS may be provided at the scoping meeting or sent to Western at the following address: email to HVSolar@wapa.gov, fax to (602) 605-2630, or mail to Ms. Mary Barger, NEPA Document Manager, Western Area Power Administration, P.O. Box 6457, Phoenix, AZ 85005. Comments may also be provided online at http://www.wapa.gov/transmission/HVSolar.htm.

To be most valuable in preparing the EIS, Western should receive written comments by the end of the scoping comment period, October 23, 2009. For further information about the environmental process, please call (602) 605-2524 or visit: www.wapa.gov/transmission/HVSolar.htm.

-30-

Western Area Power Administration annually markets and transmits more than 10,000 megawatts of clean, renewable power from hydroelectric powerplants owned and operated by the Bureau of Reclamation and the U.S.

Army Corps of Engineers in 15 western and central states. It is part of the Department of Energy.PO Box 281213 Lakewood , CO 80228-2802 Phone:

720-962-7050 Toll Free: 1-800-982-4523

Fax: 720-962-7059 E-mail: CorpComm@wapa.gov Web site:

http://www.wapa.gov (http://www.wapa.gov/) Serving the West with Federal hydropower

Jan Bush

M. FLYNN
PG 1 OF 2

From: HVSolar_scoping_comment@wapa.gov
Sent: Thursday, October 01, 2009 11:28 PM
To: HVSolarEIS@wapa.gov
Subject: Hualapai Valley Solar Scoping Comment Form

Issues, concerns or questions : I was looking forward to attending a public meeting concerning the issues raised in this area that involve solar plants and other industries planned for or in the implementation stages in this area. I won't be able to attend however, I would like to express my concerns about these planned projects in our area.

I am not really sure which way to take this letter so, I will start by laying some foundational information. This is a rural desert area where most of the water comes from deep aquifers that were filled by ice melt from the past ice age. Rain water only comprises a couple of per cent the water and since this is an arid area that doesn't amount to much and it takes thousands of years for the water to migrate through all the layers of granite, clay and other geological elements. And as you may know desert areas are particularly fragile environmentally.

The one really difficult issue is that geologists can only give you an educated guess about "how much" water we have. So, meetings turn into dueling experts where you can hire any opinion about how much water there actually is.

For all intents and purposes the water in this area is finite unless the Federal government decides to put in desalination plants at San Diego and pipe fresh water here for us to use, which is highly unlikely. Until now there hasn't been a large population and few industries outside of mining and ranching etc. to use this resource.

There hasn't been the need or desire for the local or Federal government to look at long term husbandry of water. Things are changing now however.
Historically the laws and regulations have been haphazard and patch work to control the use of water in this area and thus a gap has opened up between what people want to do and what is realistically possible for the long term.
The largest time frame used and spoken of here by regulators etc. is one hundred years and if what I have learned is true that it takes an ice age to recharge the aquifers this would seem really short sighted since the time between ice ages is thousands of years.

Under the guise of "renewable", clean etc. energy many powerful interests aided by local people have been working to setup projects of all kinds under this umbrella here. This has created a conflict between those wishing to use their land and the people who live here and there are many interests swirling around these projects i.e. jobs, political aspirations, land rights, water the environment and so forth. The unfortunate issue is that the water is not renewable.

A large group of the citizens has been trying to affect positive change to no avail and the laws etc. aren't in place to protect them and the politicians are not listening or addressing the concerns. I guess they feel that they are immune to the immediate backlash and will leave the future to take care of itself. You know that time after one hundred years.

Promises are being made that can't be keep (like building a gray water pipeline to the plant at a million dollars or so a mile) (water that was already promised to a local golf course which never happened, another broken political promise) and health concerns are being minimized to push these projects through while Federal money is available. While there are

some "not in my backyard" types most of us would like to see solar power. We don't however want them to use our water or leave a legacy of rusting closed plants in our area.

Let me close with an example. One of the large solar projects has held a series of meetings in which the information and format is changed to try and discover what combination of spin and information will give them a lever to "sell" their idea. I personally have asked them to use dry cooling, since water is so important here and they refuse to entertain that idea.

The politicians won't make the company bond enough money to remove their plant and return the fragile desert environment to its pristine condition when they are done. I guess they are afraid of being sued or desperate to stay elected and want to be able to say how many jobs they brought here.

Being a rural area I am sure that there isn't enough "government" to watch and monitor these projects adequately either. One project, a bio-diesel plant, is up wind and only a mile from a housing project with many elderly people of ill health that has only one realistic emergency exit. Now a high percentage of these plants use highly toxic materials as well as explode and burn about 17% (the last figure I heard). The county and the city of Kingman down played the danger even when it is apparent that the emergency services are not trained and there is real concern. The forces at work hope to ram these things through before politicians can be un-elected and laws put in place to create common sense development.

This all doesn't even take into account the fragile desert environment. We have endangered tortoises and bats that will be affected by all this building as well.

Although I am not a fan of more government, this is one of the rare cases where the Federal government should step in and declare a moratorium so that these egregious abuses can be stopped until mediation can be put in place to prevent decisions that can't be undone.

Now don't get me wrong, there are those who oppose anything. However, there are people here that want these plants if they are properly built and don't damage the environment or use our water. We have proposed to the company representatives that we would support dry cooling and they have flatly denied that proposal.

Bottom line: If we "guess" wrong, the desert sands will cover all we have made here as people leave when the water runs out.

Michael L. Flynn

Mail list yes - Regular mail : Yes, add me to the mailing list - regular mail

Name : Michael L. Flynn

Representing :

Address :

City :

State :

Zip Code :

Fax :

E-mail address : mikifinaz1@hotmail.com

M. FLYNN
PG 2 OF 2

Jan Bush

From: wgerwin [wgerwin@netzero.com]
Sent: Friday, October 02, 2009 7:05 AM
To: HVSolarEIS@wapa.gov
Subject: Kingman Meeting

I was unable to attend the meeting at Kingman HS on October 1st. were a presentation concerning the proposed project of interconnect Western's transmission system with HVSP.

Would it be possible to get a copy of the presentation?

Wayne

Suzann Newell

From: "Suzann Newell" <newellpost2@citlink.net>
To: <HVSolar@wapa.gov>
Sent: Monday, October 05, 2009 8:25 AM
Subject: Hualapai Valley Solar project

Mary Barger: We were unable to attend the meeting last Thursday but do want to voice our concerns about this solar project in Red Lake. Our main objection is the sole use of water rather than using solar cells.

To use 3000 acre feet of water a year from the Hualapai aquifer to generate this power, and then sell it to the highest bidder is great for the company, but certain not great for the people who depend on that aquifer for their drinking water.
When you deplete the water source and don't even offer the power generated by that water to those people, where have the people benefitted?

We live in Meadview, which is 20 road miles from Red Lake and we are well aware of the massive 'dust devils' which develope in the Red Lake area, the Haboob winds that once or twice a year develope there to rise above Garnet Mtn. and push through our area and the heavy flooding that covers the entire Red Lake area experienced during the Monsoon season. We are amazed that a company is even thinking of developing this project in this area.

Please consider the drawdown on the Hualapai aquifer; this is a desert—-any use of water from that aquifer that depletes
the amount of water available for drinking shows little regard for future generations. We favor solar and wind power but not when it depletes the water in the aquifers.

When Kingman can stress the tax base to that city and the possible tourist revenue (?), we are not certain that is a good evaluation of the situation.

Thank you for your attention to this matter.

Jack and Suzann Newell

Meadview, AZ 86444

Suzann Newell

e-mail address not accepted as
printed in Kingman Daily Miner

Jan Bush

From: clarice davis [clarice125@live.com]
Sent: Tuesday, October 06, 2009 11:09 AM
To: Ms Mary NEPA Barger
Subject: HUALAPAI VALLEY SOLAR PROJECT

I was at the last public meeting of October 1 for HVS. One of my question never did get an answer. Is this company getting a tax break ? And who is giving it ? and how much is it ? I would also like to know if they are going to apply for the government incentive program. How much leeway is Kingman affording them..

Has your office come up with any real "GREEN" rules and regulations ?? Knowing we are all in this, brand new, it seems we are really going to fast...

The biggest problem here seems to be water. I'm sure everyone is on board with that thought....Is there any current water table studies that are not instigated by HVS, but by you or some entity not directly involved with HVS ?

They did start out stating 3-4000 acre feet. It goes back to one of their first meetings in June 09. Now they have just gotten it down to another low of 2275 acre feet. It seems to drop a little every week...

I appreciate your involvement and consideration,

Thank you, Clarice Davis

EMAILING FOR THE GREATER GOOD
Join me

Jan Bush

From: clarice davis [clarice125@live.com]
Sent: Tuesday, October 20, 2009 9:35 AM
To: Ms Mary NEPA Barger
Subject: Hualapai Solar

I am part of the well know group, Hwy93AGS. We have monitored the progress of this solar group from the beginning...

I am so disappointed, on many levels , that they were approved by our Planning and Zoning Commission. I am personally concerned because they plan to use old outdated equipment. I am not opposed to Solar at all. As a matter of fact I have solar, and have for almost 20 years.

There are many companies that could do dry solar and have almost the same results the wet cooling solar has. One company I came across is called Skyline Solar. They do have a plant in California. It is located in San Jose. In their computer writeup they have stated they recycled materials from the bankrupcy of General Motors. This is a double good project. Green and recycled.

There are other reasons I am oppossed to this project. They are going to be tax exempt. There is no benefit to Kingman. They are sopossedly using affluent water, but have not signed contract or bond with Kingman.

I would hate to be stuck with that bill and massive use of water. And I might add they really don't know how much water they would use. Their guestimates have been from 4000 acre feet to the new guess of 2275 acre feet. Where are these guesses coming from. They have never been able to answer that question..

There are many other concerns. Salt/brine pools contaminating the area and aquifer. Also endangering the wildlife, and plants.

I sincerely hope you consider all the problems this project will cause.

Thank you,

Clarice Davis
3073 N. Quailnest Rd.
Kingman, AZ 86401
928 692-1840

EMAILING FOR THE GREATER GOOD
Join me

Jan Bush

From: Judi Scaliatine [hwy93ags@ymail.com]
Sent: Tuesday, October 20, 2009 7:36 AM
To: HVSolarEIS@WAPA.gov
Subject: Opposition to Hualapai Valley Solar

Dear Mary,

I am personally opposed to the approval of Hualapai Valley Solar as there is no way to monitor how much water they will be using. There is no signed contract between the City of Kingman and Hualapai Valley Solar for the effluent water nor for Hualapai Valley Solar/Mohave Sun's promise to pay for the miles of pipeline to transfer this effluent water. There is no bond established to protect the Kingman taxpayers from having this pipeline cost imposed on them should the Hualapai Valley
Solar renege on their part in this project.
I am concerned with the effects of the salt/brine ponds overflowing into and contaminating the aquifer or endangering the wildlife; plants, animals and birds.

I am also voicing the opinion of several members of the HWY93AGS (Highway 93 Advisory Groups).

Judi Scaliatine
Co-chair
Hwy93AGS
11761 E. Big Elk Dr.
Kingman, AZ 86401
909-717-3589

Jan Bush

From: Jan Sidwell [jsidwell@citlink.net]
Sent: Tuesday, October 20, 2009 12:48 PM
To: HVSolarEIS@wapa.gov
Subject: Attention Mary Barger
Attachments: panda_hello.gif; 13_c_phone.gif; 26_f_cell.gif; 33_c_fax.gif; stampa_girl_line_en.gif

Dear Ms. Barger:

As a 20-year resident in the area of the proposed Alibiassa Solar Plant, I must go on record to protest this action. Not only will this project scar the landscape of the beautiful area, it will no doubtedly lend to depleting our precious water supply. There are so many other locations in Mohave County which will not be as destructive to the future of our community. We ask you to help in our efforts to stop this damaging measure to proceed.

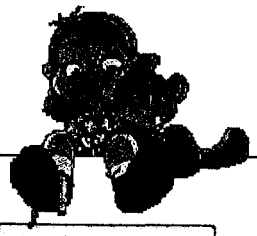
Sincerely,

Jan Sidwell, Resident
Cedar Hills Ranches, Unit 4

(928) 757-1661

(928) 279-4877

(928) 757-9209



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Jan Bush

From: James Estelle [estelleville@yahoo.com]
Sent: Wednesday, October 21, 2009 7:38 AM
To: HVSolarEIS@wapa.gov

Dear Mary,

I am told you are the person I can voice my opposition to on the Hualapai Valley Solar Plant. There is a policy in place that states no water cooled solar plants in Mohave County. I also understand they will use effluent water piped in from Kingman, but there is no binding contract at this time. As a tax payer, I don't want to have to pay a cent for a company that will more than likely help deplete the water that helps fill my well.

Our water is a VERY PRECIOUS resource.....please think long and hard before giving it away.

Thank you for listening.

Penny and Jim Estelle
7054 S. Antelope Well Ct.
Kingman, AZ

Jan Bush

From: Patti Lewis [patti@lewis.name]
Sent: Wednesday, October 21, 2009 11:26 AM
To: HVSolarEIS@wapa.gov
Subject: Hualapai Valley Solar Project

Hualapai Valley Solar Project

We have concerns about making any major changes to our area plans. Here are some I have.

1. INFRASTRUCTURE: As I have said before, the Stockton Hill Road can't handle the traffic. Three deer were killed on that road this past month. I sat for five minutes waiting for John T. Neal's cattle to move off the road. No plans for widening, repairing, fencing or securing a safe road are planned. The area is open range and it is the responsibility of the applicant to fence out, not the rancher to fence in. The infrastructure should be in place and made safe before major manufacturing is allowed in the agricultural/residential areas. Hundreds of semi trucks, used in the construction, will enter Kingman on the I-40/ Stockton Hill exit. They will immediately enter an intersection at Beverly Blvd. that is currently one of the most congested intersections in the state. True, they can be routed another direction, but Stockton Hill is the shortest route. North of Northern the road is very narrow and very dangerous and probably cannot handle the huge number of semi trucks that this construction will require. Please drive the road and see the black tire skid marks that exist today. Will the taxpayers of Mohave County be required to widen Stockton Hill Road? If so, how many years will it take for the taxpayers to recoup their money after this plant is up and running? If manufacturing is placed in the General Plan's designated manufacturing areas, the necessary public roads are already there and safe. The grid is on I-40 and the State and Federal government maintain I-40. What sort of maintenance schedule is planned for Stockton Hill Road? It wasn't designed for heavy truck use. Who is going to pay that bill? According to Mayor John Salem's words to the public, the project could draw as many as 150,000 tourists. When you figure the cars that go out have to return, that is 300,000 new cars on Stockton Hill Road. 1,500 laborers to build the system is 3,000 cars a day for the entire construction period, then 214 extra cars during operation. The old county road is not built to handle the traffic safely.
2. EFFLUENT USE: No guarantees are in place assuring the people of Mohave County that the Kingman effluent will be used. All we have seen is a letter of intent. We would like some sort of bonded assurance that this will truly happen before the Plant is permitted.
3. PARTICULATE MATTER: Given the fact that we have no guarantee, we must state our questions as if no effluent or partial amounts of effluent and/or groundwater will be used. I live in route to the Red Lake Area. My wells (5 of them) are tested regularly. The TDS count ranges from 960mg/l in wet weather to1590mg/l during drought times. The cooling water will be used in a manner that will cause water droplets to evaporate, the dissolved solids and suspended solids become airborne particulate matter (PM). How will the management of the PM be handled? Will this project cause severe problems for the Grand Canyon and the people who own ranches and animals in the area? The fires in LA brought us smoke and soot. Because of the mountains on both sides, pollution stays in the area a longer time. What will be done to prevent the escape of the PM? How will this pollution affect our bats? Yes, bats. About 12 years ago the Fish and Game or BLM (don't remember which department) decided that the fish in the Colorado River needed more food, so they dumped black gnats over the river. The fish didn't like the gnats so the gnats multiplied and moved to our area. At night, we couldn't even enjoy our porches because of the little critters. It has taken the bats about 10 years to get them back in control, but they aren't completely gone and without our bats we are going to get flooded with gnats again.
4. OTHERS SAY: Copied from an engineer I trust: Items 5 – 7 (to 8)
5. ***Precipitation*** from a saturated body of fluid which has such an over abundance of the substance that it cannot remain in solution and particles will coalesce and precipitate (literally fall out) of the solution.
6. ***Deposition*** from a solution onto a solid surface, such as the ugly stony deposits in a toilet bowl and the destructive buildups inside your domestic water supply lines.
7. ***Evaporation*** from a mass of moist air such as the billowing clouds of water vapor emanating from cooling towers. When the water evaporates from the rising column(s) of moisture, the solids which were in solution have no option but to become dry solids of detectable size and depending upon particle size, to fall out or blow with the wind. The formerly dissolved solids are then airborne particulate matter. This "stuff" has to go somewhere. If it's heavy enough, it can fall pretty much vertically from the evaporating vapor mass and evidence itself as visible dust in a generally fan shaped pattern downwind from the source. If the particulate is in small enough pieces, it can remain airborne for lengthy periods of time and many miles downwind before eventually falling to the surface or being breathed by humans and animals.

No matter how you slice it, the taxpaying citizens of Mohave County will be breathing the contaminants and paying for treatments for emphysema, pneumonia, contact allergies, etcetera. You can also plan on seeing damage to rangeland plants and detectable levels of stunting and deformation to much of the fauna in the downwind or fallout areas. You can also expect to see corrosion damage to painted surfaces and unprotected metals due to the caustic particulates.

8. FUGITIVE DUST: What controls will be in place to assure the paved roads are kept clean? Will the paving be extended all the way to Stockton Hill Road? The area has running washes both large and small, and they all cause the roads to get covered with dirt when it rains. Traffic across these roads will cause more PM. Many of the roads in the area are not paved now, but there are not 107 new people going and coming everyday, much less all the heavy truck traffic during construction of the plant.
9. EXCESS USED WATER DISPOSAL: They say the water coming off the mirrors and such will reenter the aquifer. Before that "reentering" process takes place, the used water will attract snakes, rabbits, lizards, quail, cactus wrens, frogs, turtles and all other wildlife that can fly over or enter under or through the chain link fencing. Will that water be safe for them to drink? Would block walls with deep footing help this situation?
10. SERENITY: Noise, lighting and other residential hazards that we currently enjoy freedom from are of concern to us. We leave the heavy industrial and urban areas when our shifts are finished to return to our rural lifestyles. Since heavy manufacturing with major pollutants is on our east side, west side south side and now planned for the north side, where is it our leaders want us to live in peace?

I could go on and on with the questions because this is all new to my area. Never before has such a threat against our established way of lives been handed to us by urban, industry oriented foreigners. Considering the corruption present in Mohave County today, Australia is looking good!

Respectfully submitted,
Patti Lewis

Jan Bush

From: ruby alcorn [ruuuebbi@yahoo.com]
Sent: Friday, October 23, 2009 5:25 PM
To: 'HVSolarEIS@WAPA.gov'
Subject: opposition to Hualapai Valley Solar

Dear Mary, my name is Ruby Alcorn and I have just started going to these different meetings, and I must say I am shocked that you people do not take into consideration the feeling of the other residents here in Mohave County.

I understand that there is no way to monitor how much water they will be using. As far as the waste water goes I was told it would cost in the millions to pipe the waste water from old 66 to dry red lake, and you are not able to meter a well, so there is no way of know how much water is actuall being used. There is no signed contract between the City of Kingman and Hualapai Valley Solar for the effluent water nor for Hualapai Valley Solar/Mohave sun's promise to pay for the miles of pipeline to transfer this effluent water. My question is if Mohave County is broke where is the funds coming from to pay for this endevor?

We are already having some effects of the salt/brine ponds that are effecting the plants and the wildlife in certain areas,contaminating the aquifer and endangering the wildlife;;lants, animals and birds. I am not in favor of this project!

Thank you;
Ruby Alcorn
2532 Southern Ave.
Kingman AZ.86401
928-753-6793

Jan Bush

From: vhoag556@aol.com
Sent: Friday, October 23, 2009 11:05 AM
To: 'BARGER@WAPA.gov'
Cc: 'Mike@MohaveSun.com'
Subject: Fwd: Concerned Citizen HVS ideas
Attachments: Hualapai Valley Solar Concerns.doc

I tried the HVSolar@wapa.gov and it was returned not deliverable. Hopefully this gets to Mary, if not, Mike, would you see that gets this? Thank you
Vicki

-----Original Message-----
From: vhoag556@aol.com
To: Mike@MohaveSun.com
Cc: HVSolar@wapa.gov
Sent: Fri, Oct 23, 2009 10:57 am
Subject: Concerned Citizen HVS ideas

Hello Mike and Mary
I am attaching some ideas that are of grave concern to some of the citizens here in Valle Vista. In the effort to be good citizens and neighbors, we would aprreciate your review of these concerns, and letting us know how these issues might be dealt with to the benefit of all.

I look forward to hearing from you. Please don't hesitate to contact me with any questions.

Thank you for your time.
Sincerely

Vicki Hoag
7472 Sawmill Drive
Kingman AZ 86401
586-484-1094

Jan Bush

From: Chet [chet@systemco.us]
Sent: Friday, October 23, 2009 7:04 AM
To: 'hvsolareis@wapa.gov'
Subject: WE VOTE AND WE VOTE NO

Ms. Barger:

We write in OPPOSITION to this industrial solar plant.

First, it is **NOT GREEN !**
Green is environmentally friendly.
Green is renewable.
Green does not waste natural resources.
Green utilizes the environment wisely.
Green does not pollute.
Green is people friendly and popular.

THIS IS NOT GREEN, WE CANNOT CALL THIS GREEN!

So, the question is, if its not green, why is this industrial plant being located in our back yard, by elected officials we vote in to protect us from this sort of catastrophe?

This is a polluter. It will pollute the area with bright light.
It is a water waster. It will suck the LIFE out of our already dry, arid desert.
I do not see a contract with the City of Kingman for waste water. Do You? And even so, will the waste water be able to service the plant with 100% or almost all of their voracious water needs?

A handul of jobs for water? Thats what it comes down to.
Heck no, thats no reason for this plant. its not worth the trade.

We live in a DESERT for heavens sake, why cant the powers to be understand and realize that NO ONE knows the amount of water available underground...NO ONE...even the best minds in their field will admit that they are only guessing on how much water is there. You know that.

This is our area. This is our community. This is our county.

And we say NO to the HAULAPAI INDUSTRIAL SOLAR PLANT.

Thanks.

Chet and Lyn Chetkauskas
Property Owners and Well Owners.

Jan Bush

L. TRANKA
PG 1 OF 2

From: wcachief@netscape.net
Sent: Friday, October 23, 2009 3:51 PM
To: 'barger@wapa.gov'
Subject: Hualapai Solar Project
Attachments: Microsoft Word - ADEQ - MINERAL PARK APP 12-07-08.pdf

5018 W Oatman Rd "A"
Golden Valley, AZ 86413
Email: wcachief@netscape.net

October 23, 2009

Mary E. Barger
Environmental Specialist
Desert Southwest Region
615 S 43rd Ave
PO Box 6457
Phoenix, AZ 85005-6457

RE: Hualapai Solar Energy Project

Dear Mary:

The Western States Constitutionalist Alliance, Inc., is a non-profit educational organization operating in the 13 western states. Our primary function is teaching the U.S. Constitution in schools and to government agencies and employees. From time to time we testify in court actions, before federal agencies, state legislatures, county and city governments as "expert witnesses" on matters "Constitutional" including writing memoranda and briefs.

We contact you today in regards the "Public Scoping" for the Hualapai Solar Energy Plant, in Mohave County, Arizona. While we have found no flaws or fatal errors in your process, it has become clear to us from our local membership, and other concerned citizens that "full disclosure" of the projected operations/management, equipment, financing, methodology, local environmental, social, and "cost vs benefit" analysis has not been adequately forthcoming from the "applicant". Several egregious errors in statements by the "applicant" have been presented to us. We have verified these "false statements" with nationally and internationally known experts in the field of solar furnace technology. For these "misstatements" alone, we find grounds for further study of the entire project to be justified.

We have just now started our own investigations, and ask you to consider a time extension of a minimum of 45 days, in order to receive more pertinent data regarding this project.

Please understand that we are not opposed to the project per se. We have no doubt there are many benefits. However the impact of the project is also great, and all due caution should be applied.

Respectfully yours,
Western States Constitutionalist Alliance, Inc.

Lou Tranka
National Vice Chairman
Chairman Mohave County Arizona Chapter

Jan Bush

From: Jessica Herndon [Herndon@wapa.gov]
Sent: Tuesday, October 27, 2009 8:55 AM
To: Greg Gryniewicz
Cc: Daniel Gedlinske
Subject: Hualapai power point

Greg, I will be out of the office today but can you please email Daniel Gedlinske a copy of the power Point for Hualapai?
Thank you soooo much. He has been cc'd on this so you can just reply to all.
Thank you,

This is for out meeting tomorrow in Yuma.

Jessica Herndon
Western Area Power Administration
602-605-2580
Herndon@wapa.gov

Jan Bush

From: Bridget Nash [b.nash@quechantribe.com]
Sent: Wednesday, October 28, 2009 3:01 PM
To: 'Mary Barger'
Subject: Hualapai Solar

Hi Mary –

I found the project file and the only correspondence I have received was dated September 22nd. The letter details the proponents' plans to construct the solar facility and the proposed meeting date of October 2nd.

While you mentioned in the meeting this morning that the Public Scoping had closed last Friday, I would assume that due to the delayed notification of the project that the Tribe would still be able to submit comments to be considered in the EIS. I will meet with the Committee on Tuesday and will be able to let you know of their concerns on Wednesday.

Bridget R. Nash-Chrabascz
Quechan Tribe Historic Preservation Officer
Quechan Indian Tribe
PO Box 1899
Yuma, AZ 85366
760-572-2423

Jan Bush

From: HVSolar_scoping_comment@wapa.gov
Sent: Thursday, October 29, 2009 9:52 AM
To: HVSolarEIS@wapa.gov
Subject: Hualapai Valley Solar Scoping Comment Form

Issues, concerns or questions : Replace this text to list concerns or questions you have about the proposed project.

Mail list yes - E-mail : Yes, add me to the mailing list - e-mail

Name : Glenn Hoag

Representing :

Address : 7472 Sawmill Dr.

City : Kingman (Valle Vista)

State : AZ.

Zip Code : 86401

Fax :

E-mail address : Brnzbaby440@aol.com

United States Department of the Interior

NATIONAL PARK SERVICE

LAKE MEAD NATIONAL RECREATION AREA
601 NEVADA WAY
BOULDER CITY, NEVADA 89005

IN REPLY REFER TO:

October 23, 2009

Ms. Mary Barger
National Environmental Policy Act (NEPA) Document Manager
Western Area Power Administration, Desert Southwest Region
P.O. Box 6457
615 S. 43rd Avenue
Phoenix, Arizona 85005

Subject: Public Scoping Comments – Hualapai Valley Solar Project EIS.

Dear Ms. Barger:

The National Park Service (NPS) supports the efforts of the Department of Energy (DOE) and the Bureau of Land Management (BLM) to promote renewable energy development projects in the southwestern United States. Solar energy on federal and private land presents an important dimension to meeting our nation's energy needs in an innovative and environmentally responsible manner.

The NPS and Lake Mead National Recreation Area (Lake Mead NRA) appreciate the opportunity to provide public scoping comments for the Environmental Impact Statement (EIS) being prepared by the Western Area Power Administration (WAPA) for the Hualapai Valley Solar Project proposed in Hualapai Valley, Arizona. The following comments are presented for consideration in developing the scope of the EIS for this project.

1. As WAPA and cooperating agencies proceed with its analysis and permitting of the Hualapai Valley Solar Project, it will be important to consider the potential impacts to the natural, cultural and recreational resources located in the region and in particular at Lake Mead NRA, located north of the proposed project. With this in mind, we urge WAPA and cooperating agencies to consider possible cross-boundary or even regional impacts associated with siting the Hualapai Valley Solar Project. Impacts that should be evaluated include but are not limited to:

   - water availability and water rights issues associated with concentrated solar power projects,
   - degradation of the visual resource,
   - night sky impacts (from operational or security lighting),

- air quality impacts from construction or service vehicle use, and
- destruction of wildlife habitat or interruption of wildlife corridors.

2. The NPS and Lake Mead NRA are encouraged to see that the project proponent recognizes that water is a precious resource in Mohave County and that as a matter of general policy is "*open to exploring feasible technologies and conservation techniques that minimize the impact of the project on groundwater resources*," as stated in the area plan submitted to the Mohave County Development Services Department. To that end, the NPS requests that the preferred alternatives analysis in the EIS include a thorough scoping and evaluation of the proposed technology against other feasible, alternative solar technologies, including the use of dry-cooled and hybrid-cooled solar thermal, photovoltaic, and Stirling engine solar technologies. The NPS believes that such an analysis is the best way to identify the preferred alternative that optimally balances environmental concerns with economic concerns.

3. Concentrating solar power (CSP) projects employing water-cooled, parabolic trough technology like the Hualapai Valley Solar Project can be expected to consume larger amounts of water for generation and cooling than similar systems using air-cooled technology or photovoltaic solar energy systems. In arid settings like Hualapai Valley, the increased water demand from CSP projects employing water-cooled technology could strain limited water resources already under development pressure from urbanization, agriculture, commercial interests and/or mining. As a result, additional demands on limited water resources in the valley may cause impacts to sensitive, water-dependent natural resources located in Lake Mead NRA. In formulating preferred alternatives, the EIS should carefully consider the findings of existing studies on water use for different types of solar energy projects and evaluate whether it is appropriate to approve plans of development for water-cooled solar energy projects in arid basins that might be currently over-allocated.

   The interdependence of energy production and water use is well documented by the Department of Energy. Water-use information from the 2006 Report to Congress (Source: DOE Report to Congress on the Interdependency of Energy and Water titled Energy Demands on Water Resources) states that a water-cooled, parabolic trough solar plant uses 760 to 920 gallons/MWh. A report prepared by the Department of Energy (Source: Report to Congress titled Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation) states that water consumption in the Mojave Desert is an issue with concentrating solar projects because areas of the Mojave Desert where the sun is most intense are the same areas where water is scarce. Analyses indicate that the use of either direct or indirect dry-cooling can conserve over 90% of the water consumed in a water-cooled concentrating solar power plant, while minimally increasing the cost of electricity generation by about 2% to 10%.

4. The EIS scoping process should also consider adoption of innovative policies and measures that encourage the maximum conservation of fresh water by the proposed solar energy project. A model for such an approach is the policy of the California Energy Commission (CEC) regarding the use of fresh water for power plant cooling. The CEC policy reflects a desire to minimize the consumptive use of fresh water for power plant cooling. Use of such water is approved "only when it is demonstrated that the use of other water supply sources or other methods of cooling would be environmentally undesirable or economically unsound." The NPS and Lake Mead NRA are encouraged to see that the project proponent recognizes the importance of such measures, and encourages them to continue exploring the use of an alternative water source from the new Kingman Hilltop wastewater treatment plant, but in conjunction with a similarly sized dry-cooled CSP facility. This solution would have a "net

zero" impact on groundwater resources in the valley and fully meet the annual operational water demands (estimated at 240-300 acre-feet) for such a solar plant. Additionally, the EIS scoping process should eliminate consideration of 'once-through' cooling systems, as they do not promote water conservation and are inappropriate in water-limited areas such as the Hualapai Valley.

5. The EIS scoping process should also give strong consideration to the local planning policies established in the 2005 Mohave County General Plan when formulating and evaluating preferred alternatives for the project. Focus should be given to those goals and policies established to preserve the quantity and quality of water resources, in perpetuity, throughout the County, provide opportunities for rural development with appropriate land uses and services, and support environmentally responsible commercial and industrial development that promotes a diverse and stable County economy. The following policies are particularly applicable to consider in the scoping process:

   - Policy 3.5 Mohave County will only approve power plants using "dry cooling" technology <u>when the aquifer is threatened by depletion</u> or subsidence.

   - Policy 13.8 Mohave County shall consider proposals for rural industrial uses, if such proposed uses provide significant employment opportunities for County residents, do not require the extension of public urban services, do not require a "major source" pollution permit from ADEQ (A.A.C. Title 18, Chapter 2, Article 101(64), <u>do not mine ground water</u> and are not appropriate for location in a planned industrial area. The County shall consider such proposals through the General Plan Review Process.

   - Policy 36.12 Mohave County should pursue and support industries that have smaller environmental footprints as measured by their <u>use of less water</u> and energy resources as well as their creation of fewer emissions when compared to traditional industry.

   These policies demonstrate thoughtful foresight by the County and are important to consider when viewed in light of available hydrologic information for Hualapai Valley, which suggests that depletion of groundwater in the valley (i.e., ground water mining) may already be occurring. Work conducted by Gillespie and Bentley (1971)[1] and Freethey and Anderson (1986)[2] indicated that under pre-development hydrologic conditions, inflow (i.e., recharge) and outflow to and from the Hualapai Valley was estimated at no more than 4,000 acre-feet annually. It is also important to note from these studies that outflow of groundwater from the valley is to the north toward Lake Mead NRA. Later reports by Tadayon (2004)[3] and the Arizona Department of Water Resources (2006 - 2008)[4] indicated that by 2005, groundwater withdrawal from the valley was occurring on the order of 8,300 to 9,000 acre-feet annually. Comparison of these inflow and outflow estimates indicate that the water budget for Hualapai Valley is in deficit and that ground water is being mined at an annual rate of <u>approximately 4,300 to 5,000 acre-feet. As currently designed, the proposed wet-cooled</u> solar thermal project would mine an additional 2,400 to 3,000 acre-feet of groundwater from the valley aquifer. This potentially represents a 48% to 70% increase to the current water budget deficit for the valley and a 60% to 75% decrease in the natural outflow of groundwater to the north toward Lake Mead NRA. This condition bears close scrutiny by WAPA and cooperating agencies when scoping and evaluating which solar technology is most appropriate to balancing the protection of water resources in the valley and advancement of environmentally responsible rural economic development in the County.

We appreciate your consideration of our public scoping comments and ask that Lake Mead NRA be included on the Hualapai Valley Solar Project EIS mailing list for future EIS-related correspondence. Please contact Mr. Gary Karst at (702) 293-8935 if you have any questions concerning these comments or if you need contact information for your mailing list. A copy of this letter will follow in the mail.

Sincerely,

William K. Dickinson
Superintendent, Lake Mead National Recreation Area

[1] Gillespie J.B. and C.B. Bentley, 1971, Geohydrology of the Hualapai and Sacramento Valleys, Mohave County Arizona: USGS Water Supply Paper 1899-H, 37p.

[2] Freethey, G.W. and T.W. Anderson, 1986, Pre-development hydrologic conditions in the alluvial basins of Arizona and adjacent parts of California and New Mexico: USGS Hydrologic Investigations Atlas-HA664.

[3] Tadayon, Saeid, 2004, Water withdrawals for irrigation, municipal, mining, thermoelectric-power, and drainage uses in Arizona outside of Active Management Areas, 1991-2000: USGS Scientific Investigations Report 2004-5293, 28p.

[4] Arizona Department of Water Resources, 2006-2008, Arizona Water Atlas, Volume 4.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901
OCT 23 2009

ATTN: Ms. Mary Barger, NEPA Document Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
615 S. 43rd Avenue
Phoenix, Arizona 85005

Subject: Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Meetings for the Interconnection of the Hualapai Valley Solar Project, Mohave County, Arizona

Dear Ms. Barger:

The U.S. Environmental Protection Agency (EPA) has reviewed the September 15, 2009 Notice of Intent (NOI) to Prepare an Environmental Impact Statement (EIS) for the Interconnection of the Hualapai Valley Solar Project, Mohave County, Arizona. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA supports increasing the development of renewable energy resources, as recommended in the National Energy Policy Act of 2005. Using renewable energy resources such as solar power can help the nation meet its energy requirements while reducing greenhouse gas emissions. To assist in the scoping process for this project, we have identified several issues for your attention in the preparation of the EIS. We are most concerned about impacts to water resources, biological resources, and habitat, as well as cumulative impacts associated with the potential development of multiple large-scale solar installations in the desert southwest.

We appreciate the opportunity to review this NOI and are available to discuss our comments. Please send one hard copy of the Draft EIS and two CD ROM copies to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please contact me at (415) 972-3545 or at mcpherson.ann@epa.gov.

Sincerely,

Ann McPherson

Ann McPherson
Environmental Review Office

Enclosures: EPA's Detailed Comments

Printed on Recycled Paper

US EPA DETAILED COMMENTS ON THE NOTICE OF INTENT TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT FOR THE INTERCONNECTION OF THE HUALAPAI VALLEY SOLAR PROJECT, MOHAVE COUNTY, ARIZONA, OCTOBER 23, 2009

Project Description

Hualapai Valley Solar, LLC (HVS) has applied to the Western Area Power Administration (WAPA) to interconnect the Hualapai Valley Solar project (proposed Project) to WAPA's transmission system. The interconnection would be facilitated with a new substation located at one of two alternative locations. HVS has also applied to the Bureau of Land Management (BLM) for a right of way (ROW) to build, operate, and maintain a portion of the proposed transmission line and access roads on public lands managed by the BLM. In order for WAPA to build interconnection facilities on BLM lands, WAPA must apply to the BLM to amend its ROW.

HVS proposes to construct a 340-megawatt (MW) concentrated solar thermal (CST) power plant with thermal storage capabilities using molten salt. The CST facility would consist of solar fields made up of parabolic trough solar collectors. The collectors would focus the sun's direct beam radiation on a receiver tube containing a transfer fluid. The solar energy would heat the transfer fluid, which would cycle through a series of heat exchangers to generate steam, which in turn would drive a steam turbine and generate electricity. Additional facilities include an electrical substation, a 500-kilovolt (kV) transmission line, and two access roads as well as ancillary facilities. The solar power facility would occupy about 4,160 acres or public and private land and would be located about 27 miles north of Kingman, Arizona.

The facility would utilize molten salt as a thermal energy storage system. The preliminary design for the project uses wet cooling technology for cooling the power generating equipment. Estimates for water use associated with wet cooling technology range from 2,000 to 3,000 acre-feet of water per year.

Statement of Purpose and Need

The Draft Environmental Impact Statement (DEIS) should clearly identify the underlying purpose and need to which WAPA is responding in proposing the alternatives (40 CFR 1502.13). The *purpose* of the proposed action is typically the specific objectives of the activity, while the *need* for the proposed action may be to eliminate a broader underlying problem or take advantage of an opportunity.

Recommendation:
The purpose and need should be a clear, objective statement of the rationale for the proposed project. The DEIS should discuss the proposed project in the context of the larger energy market that this project would serve; identify potential purchasers of the power produced; and discuss how the project will assist the state in meeting its renewable energy portfolio standards and goals.

Alternatives Analysis

The National Environmental Policy Act (NEPA) requires evaluation of reasonable alternatives, including those that may not be within the jurisdiction of the lead agency (40 CFR Section 1502.14(c)). A robust range of alternatives will include options for avoiding significant environmental impacts. The DEIS should provide a clear discussion of the reasons for the elimination of alternatives which are not evaluated in detail. Reasonable alternatives should include, but are not necessarily limited to, alternative sites, capacities, and technologies as well as alternatives that identify environmentally sensitive areas or areas with potential use conflicts. The alternatives analysis should describe the approach used to identify environmentally sensitive areas and describe the process that was used to designate them in terms of sensitivity (low, medium, and high).

The environmental impacts of the proposal and alternatives should be presented in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14). The potential environmental impacts of each alternative should be quantified to the greatest extent possible (e.g., acres of wetlands impacted, tons per year of emissions produced, etc.).

Recommendations:
The DEIS should describe how each alternative was developed, how it addresses each project objective, and how it would be implemented. The alternatives analysis should include a discussion of alternative sites, capacities, and generating technologies including different types of solar energy technologies, and describe the benefits associated with the proposed technology.

The DEIS should clearly describe the rationale used to determine whether impacts of an alternative are significant or not. Thresholds of significance should be determined by considering the context and intensity of an action and its effects (40 CFR 1508.27).

The DEIS should discuss the feasibility of using residential and wholesale distributed generation, in conjunction with increased energy efficiency, as an alternative to the proposed project.

Water Resources

Water Supply and Water Quality

The DEIS should estimate the quantity of water the project will require and describe the source of this water and potential effects on other water users and natural resources in the project's area of influence. The DEIS should clearly describe existing groundwater conditions, potential cumulative impacts to groundwater quantity and quality, and avoidance measures to prevent impacts. The DEIS should clearly depict reasonably foreseeable direct, indirect, and cumulative impacts to this resource. Specifically, the potentially-affected groundwater basin

should be identified and any potential for subsidence and impacts to springs or other open water bodies and biologic resources should be analyzed. The DEIS should include:

- A discussion of the amount of water needed for the proposed solar thermal power plant, where this water will be obtained, and the amount and source of power that would be needed to move the water to and through the facility;
- A discussion of availability of groundwater within the basin and annual recharge rates;
- A description of the water right permitting process and the status of water rights within that basin, including an analysis of whether water rights have been over-allocated;
- A description of any water right permits that contain special conditions; measures to mitigate direct, indirect, and cumulative impacts; and provisions for monitoring and adaptive management;
- A detailed discussion of cumulative impacts to groundwater supply within the hydrographic basin(s) that would support the alternatives, including impacts from other large-scale solar installations that have also been proposed;
- An analysis of different types of technology that can be used to minimize water use for the solar thermal power plant;
- A discussion of whether it would be feasible to use other sources of water, including wastewater or deep-aquifer water, as cooling water for the proposed solar thermal power plant;
- A discussion of whether it is possible to recycle the water that would be sent to the evaporation pond (if wet cooling is utilized) and re-inject or reuse this water; and
- An analysis of the potential for alternatives to cause adverse aquatic impacts such as impacts to water quality and aquatic habitats.

The Notice of Intent (NOI) states that the Proposed Project would utilize approximately 2,400 acre feet of water per year. We understand that the preliminary design for the project utilizes wet cooling technology. Large-scale solar installations that utilize wet-cooling may require significant water resources. Solar installations that utilize dry-cooling require much less water—up to 90 percent less. We recognize that wet cooling technology has performance advantages over dry cooling, especially in arid regions, and may be less expensive; however, due to the general scarcity of water in the region, the large number of solar project applications submitted to BLM, and the ever-increasing demand for this commodity, EPA is concerned about the depletion of this resource, particularly in desert regions.

Recommendation:
EPA recommends that the DEIS discuss the water demands of various solar technologies, including wet cooling and dry cooling systems. We also recommend that WAPA consider utilization of technologies that will minimize water use and the implementation of conservation measures that will reduce water demands.

EPA encourages WAPA to include in the DEIS a description of all water conservation measures that will be implemented to reduce water demands. Project designs should maximize conservation measures such as appropriate use of recycled water for landscaping and industry, xeric landscaping, and water conservation education. Water saving strategies can be found in the

EPA's publications *Protecting Water Resources with Smart Growth* at www.epa.gov/piedpage/pdf/waterresources_with_sg.pdf, and *USEPA Water Conservation Guidelines* at www.epa.gov/watersense/docs/app_a508.pdf.

In addition, the DEIS should describe water reliability for the proposed project and clarify how existing and/or proposed sources will be affected by climate change. At a minimum, EPA expects a qualitative discussion of impacts of climate change to water supply, and the adaptability of the project to these changes.

Disposal of Discharges

The DEIS should address the potential effects of project discharges, if any, on surface and groundwater quality. The specific discharges should be identified and potential effects of discharges on designated beneficial uses of affected waters should be analyzed. If the facility is a zero discharge facility, the DEIS should disclose the amount of process water that would be disposed of onsite and explain methods of onsite containment. If evaporation ponds will be used for disposal of condensate or other process water, identify chemical characteristics of the pond water and how seepage into groundwater will be prevented. Identify the storm design containment capacity of ponds, explain how overflow in larger storm events will be managed, and discuss potential environmental impacts (drainage channels affected, water quality, biological resources) in the event of overflow.

The disposal of wastewater or other fluids into the subsurface is subject to the requirements of the Underground Injection Control Program, pursuant to the Safe Drinking Water Act. Permits may or may not be required, depending on project specifications and federal and/or state requirements.

Clean Water Act Section 404

The project applicant should coordinate with the U.S. Army Corps of Engineers (Corps) to determine if the proposed project requires a Section 404 permit under the Clean Water Act (CWA). Section 404 regulates the discharge of dredged or fill material into waters of the United States (WOUS), including wetlands and other *special aquatic sites*. The DEIS should describe all WOUS that could be affected by the project alternatives, and include maps that clearly identify all waters within the project area. The discussion should include acreages and channel lengths, habitat types, values, and functions of these waters. In addition, EPA suggests that WAPA include a jurisdictional delineation for all WOUS, including ephemeral drainages, in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* and the December 2006 *Arid West Region Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region.* A jurisdictional delineation will confirm the presence of WOUS in the project area and help determine impact avoidance or if state and federal permits would be required for activities that affect WOUS.

If a permit is required, EPA will review the project for compliance with *Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials* (40 CFR 230),

promulgated pursuant to Section 404(b)(1) of the CWA ("404(b)(1) Guidelines"). Pursuant to 40 CFR 230, any permitted discharge into WOUS must be the least environmentally damaging practicable alternative (LEDPA) available to achieve the project purpose. The DEIS should include an evaluation of the project alternatives in this context in order to demonstrate the project's compliance with the 404(b)(1) Guidelines. If, under the proposed project, dredged or fill material would be discharged into WOUS, the DEIS should discuss alternatives to avoid those discharges.

The DEIS should describe the original (natural) drainage patterns in the project locale, as well as the drainage patterns of the area during project operations, and identify whether any components of the proposed project are within a 50 or 100-year floodplain. We also recommend the DEIS include information on the functions and locations of WOUS, as well as ephemeral washes in the project area, because of the important hydrologic and biogeochemical role these washes play in direct relationship to higher-order waters downstream.

Clean Water Act Section 303(d)

The CWA requires States to develop a list of impaired waters that do not meet water quality standards, establish priority rankings, and develop action plans, called Total Maximum Daily Loads (TMDLs), to improve water quality.

> *Recommendation:*
> The DEIS should provide information on CWA Section 303(d) impaired waters in the project area, if any, and efforts to develop and revise TMDLs. The DEIS should describe existing restoration and enhancement efforts for those waters, how the proposed project will coordinate with on-going protection efforts, and any mitigation measures that will be implemented to avoid further degradation of impaired waters.

Biological Resources and Habitat

The DEIS should identify all petitioned and listed threatened and endangered species and critical habitat that might occur within the project area. The document should identify and quantify which species or critical habitat might be directly, indirectly, or cumulatively affected by each alternative and mitigate impacts to these species. Emphasis should be placed on the protection and recovery of species due to their status or potential status under the Endangered Species Act (ESA). We recommend that the DEIS include a biological assessment under Section 7 of the ESA and provide a recent status update of this report. Analysis of impacts and mitigation on covered species should include:

- Baseline conditions of habitats and populations of the covered species;
- A clear description of how avoidance, mitigation and conservation measures will protect and encourage the recovery of the covered species and their habitats in the project area;
- Monitoring, reporting and adaptive management efforts to ensure species and habitat conservation effectiveness.

EPA is also concerned about the potential impact of construction, installation, operation, and maintenance activities (deep trenching, grading, filling, and fencing). The DEIS should describe the extent of these activities and the associated impacts on habitat and threatened and endangered species. We encourage habitat conservation alternatives that avoid and protect high value habitat and create or preserve linkages between habitat areas to better conserve the covered species. EPA is also concerned bout the potential for adverse impacts to native vegetation and/or animal species due to increased shade from the parabolic troughs after installation is complete.

Recommendations:
The DEIS should describe the condition of the land selected for the proposed project and disclose whether the land is classified as disturbed or impaired.

The DEIS should indicate what measures will be taken to protect important wildlife habitat areas from potential adverse effects of proposed covered activities and to ensure that desert areas are minimally impacted. We encourage WAPA to maximize options to protect habitat and minimize habitat loss and habitat fragmentation.

The DEIS should discuss the impacts associated with constructing fences around the project site(s), and consider whether there are options that could facilitate better protection of covered species.

The DEIS should discuss the impacts associated with an increase of shade in the desert environment on vegetation and/or species.

If the project includes evaporation and/or storm water ponds, potential hazards and impacts to humans and wildlife, especially birds, should be discussed.

Recommendation:
Explain whether any ponded water associated with the project has the potential to attract wildlife, particularly migratory waterfowl. If there is potential for exposure of wildlife to contaminants in these waters, identify mitigation measures to avoid such impacts.

Invasive Species

Executive Order 13112, *Invasive Species* (February 3, 1999), mandates that federal agencies take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause. Executive Order 13112 also calls for the restoration of native plants and tree species. If the proposed project will entail new landscaping, the DEIS should describe how the project will meet the requirements of Executive Order 13112.

Recommendation:
The DEIS should include an invasive plant management plan to monitor and control noxious weeds.

Indirect and Cumulative Impacts

The cumulative impacts analysis should provide the context for understanding the magnitude of the impacts of the alternatives by analyzing the impacts of other past, present, and reasonably foreseeable projects or actions and then considering those cumulative impacts in their entirety (CEQ's Forty Questions, #18). The DEIS should clearly identify the resources that may be cumulatively impacted, the time over which impacts are going to occur, and the geographic area that will be impacted by the proposed project. The DEIS should focus on resources of concern – those resources that are "at risk" and/or are significantly impacted by the proposed project, before mitigation. In the introduction to the *Cumulative Impacts Section*, identify which resources are analyzed, which ones are not, and why. For each resource analyzed, the DEIS should:

- Identify the current condition of the resource as a measure of past impacts. For example, the percentage of species habitat lost to date.
- Identify the trend in the condition of the resource as a measure of present impacts. For example, the health of the resource is improving, declining, or in stasis.
- Identify all on-going, planned, and reasonably foreseeable projects in the study area that may contribute to cumulative impacts.
- Identify the future condition of the resource based on an analysis of impacts from reasonably foreseeable projects or actions added to existing conditions and current trends.
- Assess the cumulative impacts contribution of the proposed alternatives to the long-term health of the resource, and provide a specific measure for the projected impact from the proposed alternatives.
- Disclose the parties that would be responsible for avoiding, minimizing, and mitigating those adverse impacts.
- Identify opportunities to avoid and minimize impacts, including working with other entities.

The BLM has received more than 150 applications for solar projects in the desert southwest. The BLM and Department of Energy (DOE) are preparing a Programmatic EIS to explain how they will address existing and future solar energy development applications on BLM-administered lands in six Western states. EPA is concerned about the cumulative impacts associated with the development of multiple large-scale solar projects in the desert region.

Recommendations:
The DEIS should identify whether the proposed project is located within one of the solar energy study areas or in close proximity to one.

The DEIS should consider the cumulative impacts associated with multiple large-scale solar projects proposed in the desert southwest and the potential impacts on various resources including: water supply, endangered species, and habitat.

As an indirect result of providing additional power, it can be anticipated that this project will allow for development and population growth to occur in those areas that receive the generated electricity.

Recommendations:
The DEIS should describe the reasonably foreseeable future land use and associated impacts that will result from the additional power supply. The document should provide an estimate of the amount of growth, its likely location, and the biological and environmental resources at risk.

The DEIS should consider the direct and indirect effects of the inter-connecting transmission line for the proposed project, as well as the cumulative effects associated with the transmission needs of other reasonably foreseeable projects.

Implementation of Adaptive Management Techniques for Mitigation Measures

Adaptive management is an iterative process that requires selecting and implementing management actions, monitoring, comparing results with management and project objectives, and using feedback to make future management decisions. The process recognizes the importance of continually improving management techniques through flexibility and adaptation instead of adhering rigidly to a standard set of management actions. Although adaptive management is not a new concept, it may be relatively new in its application to specific projects. The effectiveness of adaptive management monitoring depends on a variety of factors including:

a) The ability to establish clear monitoring objectives;
b) Agreement on the impact thresholds being monitored;
c) The existence of a baseline or the ability to develop a baseline for the resources being monitored.
d) The ability to see the effects within an appropriate time frame after the action is taken;
e) The technical capabilities of the procedures and equipment used to identify and measure changes in the affected resources and the ability to analyze the changes;
f) The resources needed to perform the monitoring and respond to the results.

Recommendation:
EPA recommends that WAPA consider adopting a formal adaptive management plan to evaluate and monitor impacted resources and ensure the successful implementation of mitigation measures. EPA recommends that WAPA review the specific discussion on Adaptive Management in the NEPA Task Force Report to the Council on Environmental Quality (CEQ) on *Modernizing NEPA*.

Climate Change

Scientific evidence supports the concern that continued increases in greenhouse gas emissions resulting from human activities will contribute to climate change. Global warming is caused by emissions of carbon dioxide and other heat-trapping gases. Global warming can affect weather patterns, sea level, ocean acidification, chemical reaction rates, and precipitation rates,

resulting in climate change. Reports also indicate that deserts may store as much carbon as temperate forests.

Recommendations:
The DEIS should consider how climate change could potentially influence the proposed project, specifically within sensitive areas, and assess how the projected impacts could be exacerbated by climate change.

The DEIS should consider the cumulative impacts associated with multiple large-scale solar projects proposed in the desert southwest and clarify how existing and/or proposed resources will be affected by climate change.

The DEIS should quantify and disclose the anticipated climate change *benefits* of solar energy. We suggest quantifying greenhouse gas emissions from different types of generating facilities including solar, geothermal, natural gas, coal-burning, and nuclear and compiling and comparing these values.

The DEIS should discuss whether the trenching, grading, and filling associated with the construction of this project and the installation of the solar troughs, will affect the deserts ability to store carbon, and to what degree this may occur.

Air Quality

The DEIS should provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), criteria pollutant nonattainment areas, and potential air quality impacts of the proposed project (including cumulative and indirect impacts). Such an evaluation is necessary to assure compliance with State and Federal air quality regulations, and to disclose the potential impacts from temporary or cumulative degradation of air quality.

The DEIS should describe and estimate air emissions from the proposed power plant, including potential construction and maintenance activities, as well as proposed mitigation measures to minimize those emissions. EPA recommends an evaluation of the following measures to reduce emissions of criteria air pollutants and hazardous air pollutants (air toxics).

Recommendations:

- *Existing Conditions* – The DEIS should provide a detailed discussion of ambient air conditions, NAAQS, and criteria pollutant nonattainment areas in all areas considered for solar development.

- *Quantify Emissions* – The DEIS should estimate emissions of criteria pollutants from the proposed project and discuss the timeframe for release of these emissions over the lifespan of the project. The DEIS should describe and estimate emissions from potential construction activities, as well as proposed mitigation measures to minimize these emissions.

- *Specify Emission Sources* – The DEIS should specify the emission sources by pollutant from mobile sources, stationary sources, and ground disturbance. This source specific information should be used to identify appropriate mitigation measures and areas in need of the greatest attention.

- *Equipment Emissions Mitigation Plan (EEMP)* – The DEIS should identify the need for an EEMP. An EEMP will identify actions to reduce diesel particulate, carbon monoxide, hydrocarbons, and NOx associated with construction activities. We recommend that the EEMP require that all construction-related engines:

    - are tuned to the engine manufacturer's specification in accordance with an appropriate time frame;
    - do not idle for more than five minutes (unless, in the case of certain drilling engines, it is necessary for the operating scope);
    - are not tampered with in order to increase engine horsepower;
    - include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the project site;
    - use diesel fuel having a sulfur content of 15 parts per million or less, or other suitable alternative diesel fuel, unless such fuel cannot be reasonably procured in the market area; and
    - include control devices to reduce air emissions. The determination of which equipment is suitable for control devices should be made by an independent Licensed Mechanical Engineer. Equipment suitable for control devices may include drilling equipment, generators, compressors, graders, bulldozers, and dump trucks.

- *Fugitive Dust Control Plan* - The DEIS should identify the need for *Fugitive Dust Control Plan.* We recommend that it include these general recommendations:

    - Stabilize open storage piles and by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
    - Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions; and
    - When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Coordination with Tribal Governments

Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), was issued in order to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal

implications, and to strengthen the United States government-to-government relationships with Indian tribes.

Recommendation:
The DEIS should describe the process and outcome of government-to-government consultation between WAPA and each of the tribal governments within the project area, issues that were raised (if any), and how those issues were addressed in the selection of the proposed alternative.

National Historic Preservation Act and Executive Order 13007

Consultation for tribal cultural resources is required under Section 106 of the National Historic Preservation Act (NHPA). Historic properties under the National Historic Preservation Act (NHPA) are properties that are included in the National Register of Historic Places (NRHP) or that meet the criteria for the National Register. Section 106 of the NHPA requires a federal agency, upon determining that activities under its control could affect historic properties, consult with the appropriate State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO). Under NEPA, any impacts to tribal, cultural, or other treaty resources must be discussed and mitigated. Section 106 of the NHPA requires that Federal agencies consider the effects of their actions on cultural resources, following regulation in 36 CFR 800.

Executive Order 13007, *Indian Sacred Sites* (May 24, 1996), requires federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian Religious practitioners, and to avoid adversely affecting the physical integrity of such sacred sites. It is important to note that a sacred site may not meet the National Register criteria for a historic property and that, conversely, a historic property may not meet the criteria for a sacred site.

Recommendation:
The DEIS should address the existence of Indian sacred sites in the project area. It should address Executive Order 13007, distinguish it from Section 106 of the NHPA, and discuss how WAPA will avoid adversely affecting the physical integrity of sacred sites, if they exist. The DEIS should provide a summary of all coordination with Tribes and with the SHPO/THPO, including identification of NRHP eligible sites, and development of a Cultural Resource Management Plan.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations, allowing those populations a meaningful opportunity

to participate in the decision-making process. Guidance[1] by CEQ clarifies the terms low-income and minority population (which includes American Indians) and describes the factors to consider when evaluating disproportionately high and adverse human health effects.

Recommendation:
The DEIS should include an evaluation of environmental justice populations within the geographic scope of the project. If such populations exist, the DEIS should address the potential for disproportionate adverse impacts to minority and low-income populations, and the approaches used to foster public participation by these populations. Assessment of the project's impact on minority and low-income populations should reflect coordination with those affected populations.

Hazardous Materials/Hazardous Waste/Solid Waste

The DEIS should address potential direct, indirect and cumulative impacts of hazardous waste from construction and operation of the proposed project. The document should identify projected hazardous waste types and volumes, and expected storage, disposal, and management plans. It should address the applicability of state and federal hazardous waste requirements. Appropriate mitigation should be evaluated, including measures to minimize the generation of hazardous waste (i.e., hazardous waste minimization). Alternate industrial processes using less toxic materials should be evaluated as mitigation. This potentially reduces the volume or toxicity of hazardous materials requiring management and disposal as hazardous waste.

Should the proposed project utilize evaporation ponds, the DEIS should describe the concentrated, dewatered solid waste associated with the evaporation pond(s) and describe whether this waste product will be transported off site for disposal.

Parabolic Trough Production/Recycling

Parabolic trough production can address the full product life cycle, from raw material sourcing through end of life collection and reuse or recycling. Parabolic trough companies can minimize their environmental impacts during raw material extraction and minimize the amount of rare materials used in the product. Parabolic trough companies can facilitate future material recovery for reuse or recycling. Several solar companies have developed approaches to recycling solar modules that enable treatment and processing of components into new modules or other projects. Solar companies can facilitate collection and recycling through buy-back programs or collection and recycling guarantees. Some companies provide recycling programs that pay all packaging, transportation, and recycling costs.

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[1]Environmental Justice Guidance under the National Environmental Policy Act, Appendix A (Guidance for Federal Agencies on Key Terms in Executive Order 12898), CEQ, December 10, 1997.

Recommendation:
EPA recommends that the proponent strive to address the full product life cycle by sourcing parabolic trough components from a company that: 1) minimizes environmental impacts during raw material extraction; 2) manufactures parabolic troughs in a zero waste facility; and 3) provides future disassembly for material recovery for reuse and recycling.

Coordination with Land Use Planning Activities

The DEIS should discuss how the proposed action would support or conflict with the objectives of federal, state, tribal or local land use plans, policies and controls in the project area. The term "land use plans" includes all types of formally adopted documents for land use planning, conservation, zoning and related regulatory requirements. Proposed plans not yet developed should also be addressed it they have been formally proposed by the appropriate government body in a written form (CEQ's Forty Questions, #23b).

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Janice K. Brewer
Governor

Benjamin H. Grumbles
Director

October 1, 2009

Ms. Mary Barger
NEPA Document Manager
Western Area Power Administration
Desert Southwest Region
PO Box 6457
615 S. 43rd Avenue
Phoenix, AZ 85005

Re: Hualapai Valley Solar Project in Mohave County

Dear Ms. Barger:

We received the Notice of Intent to Prepare an Environmental Impact Statement for the Hualapai Valley Solar Project (Project) in Mohave County. The Arizona Department of Environmental Quality, Water Quality Division (ADEQ WQD) is responsible for ensuring the delivery of safe drinking water to customers of regulated public water systems under the Safe Drinking Water Act, permits for proposed discharges to surface waters of the United States under the federal Clean Water Act (CWA), permits under the state Aquifer Protection Program, and water quality certifications of certain federal licenses and permits. With the information provided, the WQD would like to make you aware of some water quality issues that may need to be considered for the environmental review record.

Stormwater: Stormwater discharges associated with construction activities (clearing, grading, or excavating) that disturb one acre or more must obtain a general permit for coverage of stormwater discharges under the Arizona Pollutant Discharge Elimination System's (AZPDES) Construction General Permit. Permit coverage also is required for construction activities that will disturb less than one acre of land but the project is part of a larger common plan of development or sale and the entire project will ultimately disturb one or more acres. As part of permit coverage, a Stormwater Pollution Prevention Plan (SWPPP) must be prepared, and implemented during the course of construction. The SWPPP must comply with ADEQ's Construction General Permit's SWPPP requirements, and must identify such elements as the project scope, anticipated acreage of land disturbance, and the best management practices that would be implemented to reduce soil erosion and contain or minimize the pollutants that might be released to waters of the U.S. In addition to preparing the SWPPP, the project proponent must file for permit coverage before construction. The September 15, 2009 notice in the Federal Register states that the solar power facility would occupy about 4,160 acres, and would include two access roads of over one mile each. Based on this information, the Project has the potential

wastewater system. If these facilities are for human use, ADEQ is responsible for ensuring the delivery of safe drinking water to customers of regulated public water systems under the Safe Drinking Water Act, and of permitting wastewater and sewage treatment facilities under the APP program. Part of ADEQ's regulation includes design review of such facilities. Depending on the design flow of a wastewater treatment facility, a general or individual APP is available. ADEQ has delegated review of some APP general permits to Mohave County. For information on regulation of wastewater treatment facilities, please contact David Burchard in the Wastewater and Subdivision Review Unit at (602) 771-4298 or by e-mail at db2@azdeq.gov. For information on regulated public water systems, please contact Donna Calderon in the Drinking Water Unit at (602) 771-4641 or via e-mail at dml@azdeq.gov.

We appreciate the opportunity to review and provide comments. If you need further information, please contact Wendy LeStarge of my staff at (602) 771-4836 or via e-mail at wl1@azdeq.gov, or myself at (602) 771-4416 or via e-mail at lc1@azdeq.gov.

Sincerely,

Linda Taunt, Deputy Director
Water Quality Division

JANICE K. BREWER
Governor

HERBERT R. GUENTHER
Director

ARIZONA DEPARTMENT OF WATER RESOURCES

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October 21, 2009

Ms. Mary Barger
NEPA Document Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
Phoenix, AZ 85005

Re: Scoping Comments - Interconnection of the Hualapai Valley Solar Project, Mohave County Arizona

Dear Ms. Barger:

The Arizona Department of Water Resources (Department) has reviewed the Notice of Intent to Prepare an Environmental Impact Statement (EIS) for Interconnection of the Hualapai Valley Solar Project, Mohave County, Arizona published in the *Federal Register* September 15, 2009 and we submit the following comments.

Under Arizona law:

> "The director [Department of Water Resources] has general control and supervision of surface water, its appropriation and distribution, and of groundwater to the extent provided by this title, except distribution of water reserved to special officers appointed by courts under existing judgments or decrees."
>
> Arizona Revised Statutes § 45-103

The Department of Water Resources is thus the appropriate state authority to work with regarding water resources in analysis of the issues and potential impacts of the proposed action.

To ensure that the subject EIS discloses the direct, indirect, and cumulative effects of the Federal action for the Hualapai Valley Solar Project, the Department believes that the EIS should include descriptions of the water supply requirements (including quantity, quality, opportunity for reuse, and disposal) and location of use for all alternatives. Best water conservation technology should be identified as well. The existing environment section should describe water resources in the area based on the geographic area potentially impacted by each alternative. The environmental consequences section should include a description of impacts to water resources of each alternative considered.

The Department suggests that Western maintain close coordination with the Department during development of the subject Environmental Impact Statement. Thank you for the opportunity to participate in this process. For questions regarding industrial water use planning please contact Ms. Laura Grignano at 520-770-3805. If you have any questions regarding this letter please contact Mr. Bill Werner at 602-771-8412

Sincerely,

Herbert R. Guenther

Herbert R. Guenther c

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August 20, 2009

Mr. Mike LaRow
Hualapai Valley Solar LLC

Re: Hualapai Valley Solar Project

Dear Mr. LaRow:

The Arizona Game and Fish Department (Department) has reviewed the project information for Hualapai Valley Solar Project. We understand that the proposed project would construct a 340 MW generating station located on approximately 4,160 acres of semi-desert grassland habitat within sections 19-21 and 28-31 of Township 26 North, Range 16 West. The Department has the following comments for your consideration in preparation of an application for a Certificate of Environmental Compatibility for the Arizona Corporation Commission and other environmental analyses.

The Department is concerned about the amount of ground water that is required to operate the facility (3,000 acre feet/year). The Mohave County General Plan states that "estimated annual water use in Hualapai Valley will be over 14,000 acre-feet per year and exceed natural recharge placing the aquifer under stress from depletion." As a result, the lowered water table will indirectly affect Arizona's habitats in Hualapai Valley and may have considerable affects on wildlife which depend on small cienegas, springs, seeps, and marshes in the area. The Hualapai Valley Solar project will increase this affect if it is developed as a concentrated solar power facility. In the Mohave County General Plan there are goals and policies (e.g. Goal 3, Policy 3.5; Goal 36, Policy 36.12) that support industry and development that consume less water. The Department encourages Hualapai Valley Solar to consider other technologies which require less water to operate.

The Department is also concerned about the use of settling ponds to collect the highly saline wastewater in the evaporative cooling component of the proposed project. These ponds will likely attract birds, bats, and other wildlife which could then be inadvertently poisoned due to concentrated salt and other minerals. Therefore, the Department recommends the ponds be screened to prevent unsuitable and possibly fatal use.

Lastly, the Department is concerned about the possible effects of facility lighting on nocturnal wildlife. Artificial night lighting, which may be intensified by the collection mirrors, may attract insects and the species that prey on them (e.g. bats). It could also impair the ability of nocturnal animals to navigate and may negatively affect reptile populations. The Department recommends using only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, cantered, or cut to ensure that light reaches only areas needing illumination.

In conclusion, the Department recognizes the purpose and need for alternative energy development but we also recognize that solar developments will negatively impact wildlife habitat. We believe project mitigations should focus on the following primary issues related to wildlife and their habitats:

- Wildlife habitat connectivity
- Depletion of water resources
- Wildlife impacts resulting from site development and facilities
- Project monitoring to evaluate project impacts and inform adaptive mitigation solutions

The Hualapai Valley Solar Project will substantially alter or eliminate approximately 4,160 acres of wildlife habitat. Impacts to Hualapai Valley's wildlife may also extend beyond the physical footprint of the project boundaries, potentially increasing the number of acres affected by the project. Attached you will find recommendations for the project. (**Note:** The Department is in the process of developing guidelines for solar enegy development which is expected to be completed by the end of 2009). Further, Department Policy I2.3 requires that we seek compensation for potential habitat losses resulting from land and water projects in accordance with State and Federal laws. The Department would like to recommend mitigating the project through:

- funding research on the effects of solar energy to surrounding wildlife.
- protecting/purchasing land equivalent to the amount being taken or relocating on unused agricultural lands.

The Department's Research Branch has developed a monitoring plan to elucidate whether the impact of this, and other utility-scale solar projects, stops at the project boundaries or if it extends beyond the project's physical footprint. This monitoring approach would inform planning, development, and mitigation on future projects by determining the true impacts from habitat loss, degradation and fragmentation. We would be interested in presenting this plan to representative from Hualapai Valley Solar for consideration as they strive to develop renewable energy projects while minimizing impacts to wildlife resources.

Thank you for the opportunity to provide comments on this proposed project. We look forward to continued communications with Hualapai Valley Solar, LLC regarding the project development and implementation. Please contact me at 623-236-7606 if you have any questions, or would like to further discuss our concerns and recommendations.

Sincerely,

Ginger Ritter

Ginger Ritter
Project Evaluation Project Specialist, Habitat Branch

cc: Laura Canaca, AGFD, Project Evaluation Program Supervisor, Habitat Branch
Trevor Buhr, AGFD, Habitat Program Manager, Region III
Janice Stroud, AGFD, Habitat Specialist, Region III
Kevin A. Davidson, Mohave County, AICP Planner II
Karl Taylor, Mohave County, Planning Manager

AGFD #M09-07132546

Department Recommendations for the Hualapai Valley Solar Project

To minimize the potential impacts to wildlife habitat and populations resulting from the development and operation of the Hualapai Valley Solar Project, the Department recommends implementing the following:

1. We strongly encourage Hualapai Valley Solar to meet with representatives of the Department to discuss a recently developed monitoring plan that will provide data to determine the extent of this project's impacts to wildlife habitat and connectivity. Our goal is to implement this monitoring plan on a landscape-scale by partnering with the solar industry, thereby allowing us to make accurate predictions regarding the impact that these projects will have on desert ecosystems. This data will greatly inform the appropriate planning and mitigation necessary to reduce impacts to wildlife and their habitat.
2. The Department recommends additional pre-construction studies be performed which provide sufficient detail to map the habitat for all special status species within the project vicinity (e.g. wetland/riparian habitat, contiguous tracts of undisturbed wildlife habitat, raptor nest sites) and to determine seasonal movement corridors for species (e.g. winter bird concentrations, raptor migration, nesting). These maps, as well as others, should be used to show the location of sensitive resources and to establish the layout of roads, fences, and other infrastructure in order to minimize habitat fragmentation and disturbance. Pre-construction surveys should also be performed for bats since several special status bat species (e.g. Pale Townsend's big-eared bat, Allen's big-eared bat) have been found within the vicinity of the facility.
3. If wildlife is encountered during construction of the facility, it should be moved outside the project area within 1 mile of its original location. A scientific collecting permit is required for this activity. A permit can be obtained by emailing Scpermit@azgfd.gov for more information. If wildlife will need to be removed from the facility once it is operational, annual renewal of the permit will be required.
4. Project analysis should include evaluation of the direct, indirect and cumulative effects of project development on wildlife, wildlife habitat and wildlife habitat connectivity resulting from the conversion of 4,160 acres of semi-desert grassland habitat to a solar generating plant. If negative impacts are anticipated, the Department recommends implementing activities that could mitigate these impacts. Such activities may include, but are not limited to, preserving land elsewhere, restoring degraded land, and/or relocating facility footprint.
5. Project analysis should also include a thorough evaluation of the anticipated impacts to water resources. The Department strongly encourages the use of technology that requires minimal amounts of water. In the desert, water is very scarce and reducing consumption will lessen impacts on wildlife as well as the public.
6. Current hydrology of the project site should be maintained. Any change in sheet flow will have detrimental effects to down slope vegetation. In addition, consult with the U.S. Army Corps of Engineers regarding Clean Water Act issues, best management practices, and guidelines for minimizing and mitigating impacts to riparian areas.

7. For any powerlines built:
   a. Proper design and construction of the transmission line is necessary to prevent or minimize risk of electrocution of raptors, owls, vultures, and golden or bald eagles, which are protected under state and federal laws.
   b. Limit project activities during the breeding season for birds, generally May through late August, depending on species in the local area (raptors breed in early February through May). Conduct avian surveys to determine bird species that may be utilizing the area and develop a plan to avoid disturbance during the nesting season.
   c. Coordinate plant salvage and revegetation efforts with the Arizona Department of Agriculture, in accordance with the Arizona Native Plant Law. A reclamation plan is recommended for disturbed sites, where appropriate, including planting native, weed-free seed and vegetation.

The Great Spirit created Man and Woman in his own image. In doing so both were created as equal. Both depending on each other in order to survive. Great respect was shown for each other; in doing so, happiness and contentment was achieved then, as it should be now.

The connecting of the Hair makes them one person: for happiness or contentment cannot be achieved without each other.

The Canyons are represented by the purples in the middle ground, where the people were created. These canyons are Sacred, and should be so treated at all times

The Reservation is pictured to represent the land that is ours, treat it well.

The Reservation is our heritage and the heritage of our children yet unborn. Be good to our land and it will continue to be good to us.

The Sun is the symbol of life, without it nothing is possible - plants don't grow - there will be no life - nothing. The Sun also represents the dawn of the Hualapai people. Through hard work, determination and education, everything is possible and we are assured bigger and brighter days ahead.

The Tracks in the middle represent the coyote and other animals which were here before us.

The Green around the symbol are pine trees, representing our name Hualapai - PEOPLE OF THE TALL PINES -

Hualapai Tribal Nation
Department of Planning & Economic Development
P.O. Box 179/941 Hualapai Way, Peach Springs, Arizona 86434
Phone (928) 769-2216 Ext. 104 • Fax (928) 769-1063
hualapaiplanning@citlink.net

Comments; Department of Energy-Western Area Power Administration-Phoenix Arizona, August 24-09

Re: Hualapai Solar-340 megawatt –concentrated solar-wet cooled- Kingman Arizona area

Traditionally the Tribe has always been conscientious environmental stewards of their ancestral land and this includes the whole Hualapai Valley that this project is proposed in. The impacts and Cultural Concerns of the Power Plant are described by the Hualapai Tribe T.H.P.O.

Environmental and long term impacts to this style of project are also a concern. While solar energy is the absolute best energy source for meeting Federal mandates and State Renewable Energy Portfolio Standards, the water consumption required in this full wet cooled power plant is irresponsible to approve when dry cooled or hybrid technology is available to use with minimal energy production loss. All Federal Agencies including the Hualapai Tribe are required to use B.A.C.T., Best Available Current Technology including L.E.E.D., Leadership Energy Environmental Design, in deploying new capital projects. The Hualapai Tribe has exceeded L.E.E.D.in many cases and continues to excel in complying with responsible Environment Design and local Environmental stewardship.

The United States Congress requested of U.S. Department of Energy a, "Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation". Please reference this whole 24 page report , page 5 last paragraph "Air cooling [dry] and wet/dry hybrid cooling systems offer highly viable alternatives that could reduce the total water usage of steam-generating CSP Plants by 80 to 90% at a penalty in electricity cost in the neighborhood of 2 to 10% ,depending on plant location and other assumptions." The document is designed to enlighten and empower agencies to understand that we can embrace the new solar technology and still be responsible stewards to our Natural Resources, including the protection of the unnecessary waste of our valuable

underground water resources .Please require this applicant to use the Department of Energy's recommendations in Air cooling technology that are part of current water conservation measures. By not requiring them to be dry cooled is like allowing a new car to be built without a catalytic converter because it will get better gas mileage. We simply do not do that anymore. Please recognize that in the Mohave County General Plan, policy requires dry cooling for power plants within its County and it violates some Arizona State law to give approval action against a County Plan. All energy projects when looked at from and especially from a N.E.P.A. perspective have this responsibility.

The Hualapai Tribe has asked the applicant to participate in a regional area transmission interconnect meeting to consider best benefits for all new planned projects in the area, including and especially renewable projects. Four new projects are proposed in the immediate area including the Hualapai Tribes proposed 150 megawatt wind farm. We have not heard back from them on this and believe it is significantly important to have this regional collaborative planning to consider joint cost saving and good regional long range energy development planning. We request these meeting for this planning be part of the approval process and be administered by W.A.P.A with reasonable accountability and benefits marked.

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We thank you for the opportunity to give this input and look forward to the exciting new times in this paradigm shift to new clean renewable energy development .

Respectfully Submitted

Jack Ehrhardt

Jack Ehrhardt Director