Transcript Exhibit(s)

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LA PAZ GENERATING FACILITY

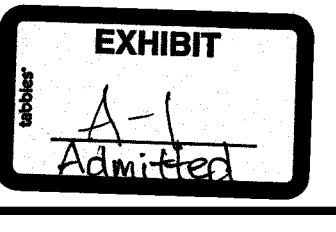
SITING COMMITTEE CASE NO. 116

Prepared Testimony

of

Kevin C. Geraghty

August 2001



Q. Please state your name and business address.

A. My name is Kevin C. Geraghty. My business address is 14122 West McDowell Road, Suite 201, Goodyear, AZ 85338.

Q. By whom are you employed and in what capacity?

A. I am employed by Allegheny Energy Supply Co., LLC ("Allegheny," "Allegheny Energy Supply" or "the Company") as the Regional Director, Western Region. In this capacity, I am responsible for Allegheny's generation projects in the Western United States. In relation to this Application, I am responsible for the permitting, design, construction, start up and operation of Allegheny's proposed 1080 megawatt project in La Paz County Arizona.

Q. Please briefly describe your background, educational and work experience.

A. I graduated from the University of Pittsburgh with a Bachelor of Science Degree in Electrical Engineering in 1987 and I have been employed by Allegheny since that time. Over my 14 years with Allegheny I have worked exclusively on the generation side of the business. I have held various positions within plant operations and construction in various engineering and management positions at several power stations. For example, I

have been the Maintenance Manager in a 1700 megawatt coal fired facility and the Operations Manager in a 2000 megawatt coal fired facility. My last position before accepting my current responsibility was as Regional Director of the R. Paul Smith Region. This region encompassed 2 coal fired plants, 7 hydro plants and 1 combustion turbine plant located in 4 different states.

I have experience in managing multiple plant installations, large retrofits, new project development and improving plant operations. I am very familiar with environmental regulations and also the process of fostering good relationships with our host communities.

Q. What is the purpose of your testimony?

A. I will briefly describe Allegheny and its operations. I will also discuss why Allegheny should be granted a Certificate of Environmental Compatibility ("CEC") for its proposed facility in La Paz County ("the Project").

Q. What other witnesses will Allegheny present in this proceeding?

A. Randall Simpson of the URS Corporation and Don Mundy of Black and Veatch will also testify on the Company's behalf. They are both consultants to the Project. Mr. Simpson will offer an overview of the environmental review undertaken with respect to the Project and its associated transmission and interconnection facilities. Mr. Mundy will provide an

assessment of the needs and benefits associated with the construction and operation of the Project.

Q. Please describe the operations of Allegheny, both nationally and in Arizona.

A. The Company's parent, Allegheny Energy, Inc. is a multifaceted energy corporation consisting primarily of three companies – Allegheny Power, Allegheny Ventures and Allegheny Energy Supply, the Applicant in this proceeding. Allegheny Energy has been offering energy services and solutions for over 90 years. It is traded on the NYSE—the ticker symbol is AYE. Allegheny Energy is on the Fortune 500 list, the Standard and Poor's 500 Index, and the Forbes "Platinum 400" list. It has annual revenues of over $4 billion and has assets of almost $8 billion.

Allegheny Energy Supply is an energy supply company which provides electricity and natural gas at wholesale to national markets. The Company develops, designs, builds and operates generating facilities as well as trading and marketing wholesale gas and electricity. Allegheny has been operating generating facilities for over 80 years and operates a diverse profile of peaking, base and mixed operation units. Allegheny's portfolio of over 12,000 MW, with an additional 2,000 MW in development, includes hydro, pumped storage, biomass, tire-derived fuel, methane gas, natural gas, coal and oil facilities. We are consistently recognized for efficient operations, maintaining a top 10 presence in that area for over 10 years in the United States. The Company maintains a

strong commitment to operating our facilities in the most environmentally responsible way that provides our customers with access to low cost generation.

In Arizona, even though the Company does not yet have a physical presence, it has sold power to Arizona utilities. Through Allegheny Energy Global Markets, over the past two and one-half years, Allegheny has sold more than one million megawatt hours to Arizona Public Service Company and the Salt River Project from positions on the Palo Verde hub and some generation in California. Obviously, once the Project is operational in late 2004 or early 2005, we would expect sales to these and other Arizona utilities to increase.

Q. What is Allegheny's Environmental policy?

A. Allegheny's facilities meet or exceed all local, state or national requirements for operations. Since 1975, Allegheny has spent more than $2 billion improving emissions and impacts from its facilities. Allegheny has reduced Sulfur Dioxide emissions from its coal fired facilities by more than 50%. NOX has been reduced by more than 35%. Allegheny's emission compliance strategy includes scrubbers, Low Nox Burners, Precipitators with advanced technologies and washed coal. Allegheny is currently investing almost 1 billion dollars at it's 2000 MW Harrison Power Station, 1400 MW Pleasants Power Station and 1700 MW Hatfield's Ferry Power Station to comply with new NOX regulations.

Allegheny has continued this tradition of environmental stewardship in relation to this Project. Even though the La Paz facility lies well outside non-attainment zones, it nonetheless will be equipped with Best Available Control Technology equipment to ensure emissions below Arizona Department of Environmental Quality and EPA standards.

Q. What is Allegheny's Community Relations policy?

A. Allegheny maintains a policy of engagement and support for our host communities. Allegheny forms working groups at each facility, provides access to resources within our projects and strives to support charitable activities with employee involvement and financial contributions.

Allegheny forms Community Advisory Panels at all generation facilities, even those in development, and uses third party professionals to facilitate the panels. The main objectives of the panels are to establish strong communication lines, educate and keep the community informed about operations and receive community input.

This Project's Advisory Panel was formed in May of this year, and has met twice. It consists of more than 20 members ranging from nearby residents to public officials. Materials concerning the La Paz Community Advisory Panel are included in Exhibit J-3 to the CEC Application.

Q. Why has Allegheny decided to site a project in Arizona?

A. Arizona itself is a very rapidly growing market and is also centrally located to serve other growing WSCC areas. Allegheny already trades out of the Palo Verde hub, as I mentioned earlier, and a physical presence will enable Allegheny to offer longer term structured deals to local and regional buyers.

Q. Has Allegheny determined that a need exists for the Project?

A. Don Mundy of Black & Veatch will explore this question further, but the short answer is yes. The Project will help meet current and future energy needs in Arizona and the southwest, assist in assuring an adequate, economical and reliable electricity supply and provides several other system benefits as Mr. Mundy will discuss.

Q. What is the capacity of the Project?

A. The Project would be nominally rated at 1,080 MW, but this rating is at one set of ambient conditions. Additionally, the Project would employ a supplemental duct-firing system that would enable the project to maintain the 1,080 MW rating under the most extreme high temperature conditions. This same SDF system would allow the project to generate more than 1,080 MW during colder ambient conditions when demand and line capacity are available.

Q. When will the Project be commercially available?

A. The first 540 MW "block" would be ready for service in October 2004. The second 540 MW "block" would be available in April 2005.

Q. When would construction need to start?

A. In order to meet this projected "in service" date, construction would need to commence by September 2002.

Q. Where would the Project electrically connect?

A. The Project will interconnect to Southern California Edison's (SCE) Palo Verde – Devers 500 KV transmission line which lies approximately one and three quarter miles north of the Project.

Q. What is the fuel source for the Project?

A. Natural gas is the source of fuel for the Project. Diesel fuel, however, would be used to power emergency equipment such as fire pumps and generators during blackout conditions.

Q. Where will Allegheny get the natural gas?

A. Allegheny will tie into an El Paso Natural Gas interstate pipeline which runs about four miles south of the Project.

Q. What will the Project's source of water be?

A. The Project will use groundwater obtained from the Harquahala Valley Irrigation Non-Expansion Area. Allegheny has acquired 2,325 acres of irrigable land with water rights that allow withdrawals for commercial and industrial uses such as the Project. The groundwater rights available generally for use amount to 6,975 acre-feet per year.

Q. How much water will be used?

A. The Project will use 6,500 acre-feet per year as designed. This usage represents at least a 40% reduction in water use as compared to the water rights associated with the lands' historic irrigated agricultural use.

Q. Did Allegheny consider any other sources of water?

A. Yes. Allegheny reviewed the possible use of CAP water but rejected that possibility based on its uncertain long term availability, quality and cost.

CAP water availability is not capable of being firmly predicted. Instead, its availability is determined on a yearly basis based on several factors including annual river flows and other states' water rights. The Project is a baseload facility. Therefore, water availability must be known and certain to ensure plant operations and to enable the structuring of long term deals.

CAP water also is higher quality water than groundwater. Therefore, it makes sense to reserve CAP water for domestic uses or other higher quality requirements than plant cooling.

Finally, while the cost of CAP water itself does not preclude its use, the need for an assured supply and therefore a backup source does. Therefore, the Project would need to acquire the 2,300 acres of irrigable property regardless of CAP water use.

Q. How will Allegheny manage the property associated with the retired groundwater rights?

A. The properties Allegheny purchased were acquired so as to afford the best land management plan possible. The properties purchased are either currently irrigated by CAP water through the Harquahala Valley Irrigation District or are grazing properties. Allegheny plans to maintain the leases for the farm properties so that the agriculture economy of the Harquahala Valley is not adversely impacted and plans to maintain the grazing access associated with the other properties.

Q. What methods are being used by Allegheny to minimize the use of water?

A. The Project will be equipped with advanced water softening equipment which will maximize the reuse of water before discharge to the evaporation pond. The cooling towers will employ high efficiency drift eliminators to reduce water losses to drift. Additionally, Allegheny is exploring the possibility of using a nearby recharge facility for cooling tower blowdown.

Q. Please describe the operation of the Project.

A. The plant will consist of two 540 MW power "blocks". Each block will consist of two gas turbines and one steam turbine. Basically the gas turbines use gas similarly to how jet engines operate. They are coupled to generators and produce power by turning the generators. The waste heat leaving the gas turbines is used to make steam in boilers. The steam is fed to a steam turbine, which also produces power by turning its own generator. Cooling towers are then used to condense the spent steam back into condensate for reuse by the steam turbine.

The plant will employ Selective Catalytic Reactors (SCR) to remove oxides of nitrogen (NOX) to 2.5 ppmvd. SCRs use aqueous ammonia and catalyst "cells" to convert NOX into Nitrogen and Water.

The plant also will use an oxidizing catalyst, almost identical to an automobile's catalytic converter to reduce emissions of Carbon Monoxide (CO) to 5.0 ppmvd.

Q. Has Allegheny secured the equipment for this Project?

A. Yes. Allegheny has secured the Gas Turbines and Steam Turbines for the Project. They are scheduled to be delivered to the Project site starting in September 2003 with the first steam turbine and ending in July 2004 with the last gas turbine.

Q. How much of a financial commitment has Allegheny already made to this Project?

A. More than $200 million have already been committed to the Project and its anticipated cost will be more than $500 million.

Q. Will Arizona ratepayers be affected by the Project?

A. Only in a positive fashion. Arizona ratepayers have no obligation to pay for the Project. Unlike the regulated world, Allegheny assumes all economic risks and ratepayers will not see any increased charges as a result of the Project. On the other hand, Arizona's public utilities will have greater access to increased competitive generation which should help to keep stable or possibly reduce rates paid by Arizona ratepayers. An abundant supply of a commodity is a must to maintaining stable, low prices.

Q. Has Allegheny studied the impacts this Project will have on La Paz County?

A. Allegheny has studied the Project operation on the current and future land uses in the area. The site was chosen for the very minimal impacts the Project would have on existing land uses. The Project will also have an immediate and positive impact on the County. Jobs related to the construction and operation will bring much needed spending dollars to the County and State. The property taxes generated by the Project will allow the County to reduce the tax burden on local residents. Finally, the Project's improvement of infrastructure at this location will improve the area's opportunity to attract other commercial operations. The economic and fiscal impact of the Project is analyzed and discussed in the ASU College of Business Study which is Exhibit J-1 to the CEC Application.

Q. Are any local approvals required for this Project?

A. Yes. The Project will require rezoning to Heavy Industrial and will require a special use permit. We anticipate these approvals shortly.

Q. What has the public response been to the Project?

A. Extremely positive. Public contact information is supplied at Exhibit J-3 of the CEC Application. In addition to the Community Advisory Panel process I discussed earlier,

Allegheny has received uniform public support at Open Houses conducted throughout the area.

Q. Has Allegheny performed the necessary studies to allow this Committee to grant a CEC based on the factors identified in A.R.S. § 40-360.06?

A. Yes. Allegheny has performed all of the necessary environmental impact studies to support the grant of a CEC for the Project. Mr. Simpson discusses these studies in greater detail.

Q. Do you have a recommendation for the Committee?

A. Yes. On Allegheny's behalf, I request that the Committee issue a CEC for the Project.

Q. Does this conclude your testimony?

A. Yes, it does.

12921-0004/949553

LA PAZ GENERATING FACILITY

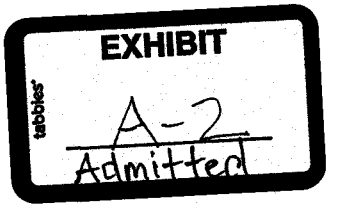
SITING COMMITTEE CASE NO. 116

Prepared Testimony

of

Donald L. Mundy

August 2001



Q. Please state your name and business address.

A. My name is Donald L. Mundy. My business address is 11900 East Cornell, Suite 300, Aurora, Colorado 80014.

Q. By whom are you employed and in what capacity?

A. I am employed by Black & Veatch, an engineering and construction company, as Vice President and Western Regional Director of the Power Delivery Business. In this position I am responsible for management, administration, planning and control of projects associated with power delivery facilities including substations, transmission lines and distribution systems.

Q. Please briefly describe your background, educational and work experience.

A. I received a Bachelor of Science degree from Purdue University in Electrical Engineering in 1971. While attending Purdue University, I was employed as a student engineer by the local electric utility company. I continued employment with that utility after graduation as a Transmission and Distribution engineer and subsequently joined Black & Veatch in 1975. I have been involved in consulting, engineering and construction related activities associated with electric Power Generation, Substations, Transmission Lines and Distribution System projects for over 30 years. I am a Senior Member of the Institute of Electrical and Electronic Engineers, a member of the National Society of Professional

Engineering and currently hold Professional Engineer Registrations in the States of Indiana, Florida, Louisiana, Missouri and Colorado.

Q. What is the purpose of your testimony?

A. I will address need and benefit issues regarding Allegheny Energy's proposed La Paz Generating Facility (the "Project").

Q. Briefly, what are the issues that produce a need for new generating facilities?

A. New generating facilities are typically needed for Growth, Retirements, Environmental Issues, Pricing Stability, Security and Ancillary Services. This Project assists Arizona and the region in meeting all of these needs.

Q. Explain how Growth in this region creates a need.

A. Local (Arizona) and Regional (New Mexico, Arizona, Southern Nevada and California) growth in population and economic production/consumption of products/services are primary drivers for increases in electric power demand and energy consumption growth. This growth must be served with a variety of new generating facility additions, incremental generating facility enhancements and a series of conservation measures.

Q. What are the growth projections for this region?

A. From a population perspective, according to the Bureau of the Census, from 1995 - 2025 the Western United States is projected to grow at a rate nearly twice the national average. The first eight of the fastest growing states are Western States. From 1995 - 2025, Arizona is ranked the fourth fastest growing state, led only by California, New Mexico and Hawaii. From 1995 - 2025, the Arizona population is expected to increase by more than 50%. Arizona will likely exceed that projection given that the second quarter 2001 population estimates indicate that Arizona has already reached the year 2005 original projected levels. Current population growth projections for 2001 indicate a growth of 2.7% from 2000 levels.

Q. What are the economic growth indications?

A. Based on forecasts from the University of Arizona, the economic outlook is very good. The local economy will generate 72,000 jobs this year, sales gains should grow by 2.5-3.5%, residential building will be in the 50-55,000 unit range and personal income will continue to rise annually in the 5-6% range.

Q. What are the growth projections for electric power in the region?

A. According to the Western Systems Coordinating Council (WSCC), electric growth forecasts indicate a combined growth in the New Mexico/Arizona/Southern Nevada area

of 3.6% per year for over the next 10 years. This growth is the highest of all WSCC regions and is about twice the national average.

Q. What do these levels of regional growth mean in terms of new generating facilities requirements?

A. Keeping in mind that Arizona's actual growth is already exceeding estimates, the projected growth will require regional generating facilities adequate to serve at least 700 MW of new electrical load annually. The Project meets a portion of this need by adding approximately 1000 MW in the local area that can be used to serve both local and regional electric energy needs.

Q. But, other power projects have been announced or are under development in this area, so why do we need this Project?

A. For a variety of reasons. In today's merchant development situation, no one has a duty to build a power plant to meet customer growth or even to maintain a certain amount of generation as older units are retired. While many projects have been announced, some of these projects may not actually be built. Some developers will or may back out under certain market or regulatory conditions and some projects may not be fully licensed. For example, the Commission recently discussed at an Open Meeting that construction plans on several western plants including one in Arizona had been stopped because of the developers' adverse reaction to the FERC's June rate cap order.

Q. Can you elaborate on the concept that some projects may not be built?

A. Yes. Based on a general review of Arizona projects that have been publicly announced, are in some stage in the CEC process, have completed the CEC process, are under construction or have recently come on line, the total generation on the horizon would add to values around 17,000 MW or so. But, of that 17,000 MW, only the South Point Project, the Griffith Energy Project, the Desert Basin Project and the West Phoenix Project which amount to about 1850 MW are actually on line. That leaves about 15,000 MW still at risk of completion.

Q. How are the remaining 15,000 MW at risk?

A. Of that number, only about 8900 MW or 60% have completed the CEC process. Further, some of those that have completed the process are being built in phases which allows the developer to stop at various points in the event that market conditions soften or some business or regulatory reversal occurs.

Q. So of the 15,000 MW at risk what is probably going to be built?

A. It is very doubtful that all of the planned capacity will be built either as planned and scheduled or at all. Many projects in this new uncertain marketplace have been announced and then been cancelled. It is my experience that less than 50-60 %--in this case 7,500-9,000 MW--of the projects that we hear about are actually completed.

Q. Are you aware of any published opinion regarding the likelihood of predicted new power projects in Arizona actually being constructed?

A. Yes. The WSCC 2000-2009 plan indicates it believes only about 10,205 MW of new Arizona generation will actually be built during that period. Roughly 1760 MW of that list has now been built. That leaves about 8500 MW of new generation yet to be built or only 56% of the 15,000 MW discussed earlier. That percentage is consistent with my experience and indicates a fair amount of skepticism on the part of WSCC about just how many announced or certificated plants will, in fact, be built.

Q. Do retirements of existing generating facilities also enter into the need assessment?

A. Yes, very much so. We tend to think of today's generation capacity as a solid base line that will always be available, but that is not the case. Generating facilities will be retired in the region over the next decade. The exact numbers are unknown and in part will be based on economics, mechanical life, fuel supply issues, changing land use patterns and availability and capacity of the remaining generating facilities in the region. These retirements--both those that may be forced and those that may be desirable--create a need as they decrease the aggregate amount of power production facilities available to meet current and future electric demands.

Q. In general, how old are the Arizona generation facilities?

A. The Arizona facilities date back to about 1909. By the year 2005, when the La Paz Project is scheduled for operation, of the generation that is now currently available in Arizona, about 40% of that generation will be over 30 years old, about 20 % will be more than 40 years old and about 10% will be over 50 years old. This means that more than 6000 MWs of Arizona's power plants will be 30 years or older when this Project is scheduled to be fully operational.

Q. How will the La Paz Project help with these aging facilities?

A. Obviously, these plants are typically less efficient, require much more maintenance and may be less reliable than the new plants. The Project meets this need by adding approximately 1000 MW of the most efficient production capability available in the local area that can be used to serve both local and regional electric energy needs.

Q. How can we be assured that adequate supply will always be available?

A. The simple answer is we can't. In the pre-deregulation days, utilities had a duty to serve and were responsible to try to plan and construct facilities to meet the predicted loads in the region with ample reserves. In today's market, no one has a duty to serve and market forces will determine the supply side of the equation. However, given (1) the uncertainties of plants actually being constructed, (2) the uncertainties that some

developers might not be as good as others in this business and thus may fail and (3) the desire to maximize profits, it would seem prudent to have a greater reserve margin in the region on a going forward basis than has been necessary in the past.

Q. With all of the plants being considered for construction, even if a few are retired, won't we still have an abundance of supply?

A. Not necessarily. In today's market, just because a power plant is in your area does not mean that you will be able to utilize output from that plant. As an example, some plant owners may find that in some cases the surrounding area markets are more attractive and may sell their power elsewhere, thus diminishing local supply. Also as older plants retire and new ones are added, the transmission grid will become used in different ways and at times the grid may not allow delivery to certain locations. There also is no assurance that once constructed, the plants necessarily will be run at times of local need.

Q. Do environmental issues also create a need for new capacity such as this Project?

A. Generating facilities constructed 20, 30, 40 or more years ago generally are using technology that uses more fuel and produces a greater environmental impact than current technology to produce the same energy. While some of these facilities have been upgraded, in many instances it is impractical from either a cost or technology perspective to do so and rarely, if ever, can such upgrades bring these older units to today's efficiency and pollution standards.

Q. How does the Project help this need?

A. The need to use less fuel (be more efficient) and to improve environmental quality (lower emissions) is a pressing issue. The Project meets this need by using the best fuel-efficient technology available coupled with the lowest possible emission levels attainable.

Q. Please explain how the issue of pricing stability enters the need analysis.

A. For over a century, the United States has enjoyed the benefits of a regulated electric industry. While that industry had some good and bad points, it did provide a fair measure of stability in the price of electricity. Although at times some would argue that the price was too high, it was reasonably slow to change and the future price was somewhat predictable on a regional basis. We are now entering a deregulated business climate and are still working through the issues on how to adjust to this new situation. However, one item appears certain. While deregulation will bring certain benefits--among those a more competitive pricing landscape--the stability and predictability of that pricing will be very dependent upon supply and demand, just like any other free market commodity. Assuming, in the deregulated world, that we still have a desire (a need) to have reasonably stable and predictable pricing, then we must have an ample supply and choice alternatives when it comes to buying electricity. Recent developments in California and elsewhere in the country have underscored the importance of this point.

Q. How does the Project help fulfill this need?

A. The Project meets this need by adding approximately 1000 MW in the local area thus increasing supply that can be used to serve both local and regional electric energy needs.

Q. Please explain in the form of an example the need issue concerning system security?

A. The typical electric customer has learned from childhood that when you turn on the switch that the lights go on. Regardless of whether that customer is downtown, in the suburbs or in the country, so long as the electric system is intact, that premise seems to work. Most customers have also learned that when storms or floods arrive suddenly that sometimes the lights go off in limited areas, but not always at their house. Many a child has called Grandma during or after a storm to find out that her lights were out, but that the child's lights were still on. The ability to always have enough power everywhere to isolate outages and to control them to limited areas is system security. As the demands for power grow and the areas that want power change from open range to new housing and commercial districts, local and regional utilities and the power producers must work together to maintain system security. The utilities regularly analyze various scenarios to determine just how serious a condition would result if a given transmission line or power production facility were suddenly to experience an outage. These scenarios look at the physical location of facilities, the sizes of each element, how much margin is available at any moment in the system or a given area and the consequences of any given outage.

Q. Does the Project help with the system security need issue?

A. Yes, in two ways. The Project meets the need for sustained and improved system security by (1) adding 1000 MW to the local/regional system which increases reserve margins and (2) adding the Project at a location away from other power production facilities, thus avoiding a common outage condition. For example, several of the new plants being discussed in the area are planned to be interconnected at the new Hassayampa Switchyard. If a major problem were to occur at that switchyard, the region could experience a sudden and perhaps prolonged loss of generation resources. This Project interconnects away from that switchyard. By interconnecting to the grid at a different location as the Project does in La Paz County, the probability of a single contingency taking out more than one generating plant is diminished.

Q. Please explain the need for ancillary services.

A. The electric system needs more than just generators and wires to make it work. Among the many needs to keep the system working properly, are items like var support, voltage regulation and spinning reserves. These items are commonly referred to as ancillary services. Without getting into details, these components are made available by power production facilities based on the manner in which those facilities themselves are operated. As an example, during hot summer days, electric systems are often stressed and voltages begin to drop causing the common condition known as "brownout." This condition is most easily visible in lighting systems, but it can cause equipment

overheating and failures in some instances. To avoid this problem, various power production facilities are called upon to raise voltages to reach and maintain desired levels.

Q. Does this Project help provide these Ancillary Services?

A. Yes, the Project helps fulfill these needs with added generation facilities that are capable of providing both local and regional ancillary services.

Q. Does the addition of the Project in this region of western Arizona offer any additional technical benefits?

A. Yes. By adding a new generation source in the region, general reliability will be increased by providing more resources. But, more specifically as to this Project, locating the new plant some distance both physically and electrically from Palo Verde and its satellite switchyard area increases system reliability should some form of disturbance occur at that major power center. Also, this Project is the only new Arizona plant proposed to be interconnected to the Devers-Palo Verde transmission line, at a location removed from the new Hassayampa Switchyard. Thus, the Project will provide unique voltage support and reduce regional system losses on this line.

Q. Does interconnecting with the Palo Verde-Devers transmission line at this Project's location in La Paz county produce any other local benefits?

A. Tapping a 500 kV transmission line is an expensive proposition. In many instances, local development of new service facilities or even strengthening of the local sub-transmission grid cannot be cost justified due to the high cost of tapping a 500 kV transmission line. In this situation with the tap switchyard being needed and cost justified by the La Paz Project, it will then be much easier at a lower cost to improve the local area's sub-transmission service and reliability.

Q. Where would the Project electrically connect?

A. The project would interconnect to the Palo Verde – Devers 500 KV transmission line approximately one and three quarter miles north of the Project and about 45 miles west of Palo Verde.

Q. Please briefly describe the interconnection facilities.

A. The interconnection facilities begin at the generating facility with a 500 kV Switchyard which "collects" all of the new generation. Then, a new single 500 kV transmission line takes the power north to a new tap switchyard located adjacent to the Palo Verde - Devers transmission line. The interconnection tap switchyard on the Palo Verde - Devers line would be configured in such a manner as to "cut" the Palo Verde - Devers line into two

lines. One line would run from the tap switchyard to Devers and one line from the tap switchyard to Palo Verde. This configuration allows the new plant to remain connected to the grid with the loss of either the line to Devers or the line to Palo Verde. In a similar manner, should the line to the new plant be lost, the lines to Devers and Palo Verde would remain in service and connected together to allow power to flow as if the new plant tap switchyard had never been constructed.

Q. Are these interconnection facilities typical of others in your experience?

A. Yes. Most new generating facilities have these three components.

Q. The Project will use a single transmission line to interconnect. Is that also common?

A. Yes. The use of one or more transmission lines is typically based on either capacity or reliability issues. A single 500 kV transmission line can easily accommodate this Project's full output capability. As for reliability, in this case a meteorological forced outage of this length of interconnection could be expected only once every 50 years. A line designed to this standard typically meets or exceeds the National Electric Safety Code standard.

Q. What is meant by the term forced outage?

A. That term refers to outages that are not planned and that occur suddenly while the line is being used. They could result from meteorological events, earthquakes, auto accidents, structural failures and similar incidents.

Q. How are outages from meteorological events predicted?

A. The US Weather Service maintains long term records of actual wind, temperature and storm conditions. These statistics are then used to predict the recurrence interval of a certain meteorological condition such as high winds. As an example, it is predicted that a high wind of 70 mph will occur in this area every 50 years. Once a design recurrence interval such as 50 years is selected as the design basis, then the particular condition--such as a 70 mph wind--becomes one of the many withstand loads that are used in selecting the materials and designs for the transmission line.

Q. Based on this discussion, would a single transmission line designed to withstand a 70 mph wind be adequate for the Project?

A. Yes.

Q. What about the effects of lightning?

A. Lightning strikes can damage a transmission line and can cause an outage. However, modern designs using multiple shield wires above the 500kV conductors reduce the probability of a lighting cased outage to very low probability for lines as short as the one we are discussing. These shielding techniques would be employed on the Project.

Q. How do you handle the other events that you mentioned that can possibly cause a forced outage of a Transmission line?

A. Most events can be handled similar to the meteorological analysis, but in some cases it is more prudent to use avoidance techniques. As an example, if we are concerned about auto accidents, then the line is constructed away from roadways or with additional barriers near the ground line.

Q. Other than for maintenance reasons, why would someone build two transmission lines from a power plant to an interconnecting line less than two miles away?

A. The most likely conditions are that the two transmission lines might be needed for capacity. Or, it might be less expensive in some situations. Or, it could be that terminal configurations are designed to allow the power in each line to be flowing in opposite directions.

Q. Are any of these an issue for this Project?

A. No. A single 500 kV circuit is adequate. It would add cost to build a second line and the configurations at each end would not permit concurrent opposite flows. Obviously, building a second and unnecessary transmission line would also produce unnecessary environmental impacts.

Q. Does the proximity of the La Paz Project to the existing transmission line corridor offer any special transmission line considerations?

A. Yes. The very short length of the transmission line from the new plant to the Palo Verde-Devers line makes it almost as if the plant were being built directly under the existing transmission line. From that perspective, the Project has the advantage of almost no transmission element to become integrated into the grid. That situation improves losses, enhances reliability, reduces overall cost and minimizes environmental impacts.

Q. Can the Devers Palo Verde line accommodate the output of the Project?

A. Yes.

Q. Has Allegheny studied the impacts that the Project would have on the interconnected transmission system?

A. A System Impact Study is currently being performed by Southern California Edison, the owner of the Devers-Palo Verde line. Based on my knowledge of the line, the interconnection of the Project will not compromise the reliable operation of the interconnected transmission system.

Q. Could you please explain the basis for your opinion that Project Interconnection will not compromise the reliable operation of the system?

A. Yes. Utilities go to great lengths to insist on system reliability. In the case of new generating facility additions, they will conduct several pre-construction studies, such as power flow, Transient Stability, Post-Transient Stability and short-circuit Duty. Further, the utility will require that the new facility owner agree to certain operating terms that address issues like conducting routine tests, coordination of protective devices, maintaining good frequency and voltage regulation and similar items. Finally, all of these requirements are incorporated into contractual agreements to ensure that no misunderstandings occur. As a last resort, the utility reserves the right to immediately disconnect the generating facility, in the event that they believe it is or is about to do the system harm.

Q. Does this conclude your testimony?

A. Yes.

12921-0004/950118

LA PAZ GENERATING FACILITY

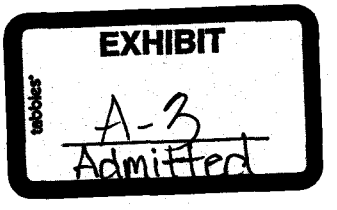
SITING COMMITTEE CASE NO. 116

Prepared Testimony

of

Randall L. Simpson

August 2001



Q. Please state your name and the status of your employment.

A. My name is Randall L. Simpson. I am a senior project manager and planner for URS Corporation, a consulting firm located in Phoenix, Arizona.

Q. Please describe your education and professional experience.

A. I received a Bachelor of Science degree in Environmental Design in 1992 and a Bachelor of Landscape Architecture degree in 1993, both from North Dakota State University. I have 10 years of experience in environmental planning and electrical facility siting studies, with an emphasis on land use planning and visual resource inventory, assessment and mitigation planning. I have participated in environmental studies for 10 generating facilities and 14 transmission lines throughout Arizona, as well as in several other states.

Q. Are you familiar with the Arizona Power Plant and Transmission Line Siting Committee ("the Committee")?

A. Yes, I have participated in three power plant and seven transmission line siting projects that have been presented to this Committee and have assisted in the preparation of studies, testimony and supporting materials for presentation in these cases.

Q. What services have you performed for Allegheny's La Paz Generating Facility ("the Project")?

A. I have served as URS project manager and was responsible for overseeing the environmental studies and preparation of the Application for a Certificate of Environmental Compatibility ("Application"). URS environmental scientists and planners conducted the land use, biological resources, cultural resources, visual resources, water supply and noise analyses. Additionally, I coordinated our reviews with Applied Environmental Consultants, which was responsible for preparation of the Air Quality studies and Hydrosystems, which assisted with the preparation of the water supply studies.

Q. Please describe the main topics and scope of your testimony.

A. First, I will present an overview of the project site conditions. Second, I will describe the land use, biological resources, cultural resources, visual resources, noise, water supply, and air quality studies conducted for the Project and the results of those studies. Finally, I will provide my conclusion on the environmental compatibility of the Project.

Q. Please describe the site and land uses in the vicinity of the Project.

A. The Project is located in an unincorporated area of La Paz County, about 21 miles southeast of Salome and Wenden. URS conducted an inventory of existing land uses within a 2-mile radius of the boundaries of the proposed generating facility and proposed transmission line. The Exhibit A-3 map in the Application shows the existing land uses in the vicinity of the Project and the inventory results are described in the land use study

report (Exhibit A). The study area including the generating facility site is either irrigated farmland that is currently in production, fallow agricultural land used for cattle grazing or non-developed desert scrub land.

There are several compatible industrial land uses in the area including the Palo Verde-Devers 500kV transmission line, the Central Arizona Project canal, the Vidler Water Company's water recharge facility, and an El Paso Natural Gas pipeline corridor and compressor station. Scattered 12kV distribution lines and several aboveground wells also are located within the area. There are one main and two secondary transportation corridors in the Project area. Interstate 10 is the primary corridor and is less than 3/4 of a mile north of the proposed generating facility. Avenue 75 East provides access to the proposed generating facility site from Exit 69 along Interstate 10. Salome Road is located 3 to 4 miles north-northeast of the proposed transmission line interconnection and switchyard site.

The nearest residence outside of the proposed generating facility boundary is approximately 1.75 miles north. A recreational vehicle park, as well as other scattered residences, are located approximately 2.5 to 4 miles away. The Project will not displace any existing or planned residences in the area.

Q. Please describe the planned land uses in the Project's vicinity.

A. The La Paz County Zoning Regulations guide future land use in the unincorporated areas. As shown on the Exhibit A-4 map which was filed with the Application, the Project site is currently zoned "Rural Residential." However, the facility site is in the process of being rezoned for heavy industrial use by La Paz County. Allegheny also will develop a well field in Section 1, Township 2 North, Range 11 West. Allegheny owns the 160 acres of land within the southwest quarter of this section, which is already zoned for heavy industrial use, and has initiated a land exchange with the Bureau of Land Management (BLM) to acquire the remaining 480 acres of land within the section. The BLM has prepared a Feasibility Analysis and recommended proceeding with the exchange on August 10, 2001.

After submittal of the original Application, we learned of two additional zoning cases which had been approved by La Paz County about 15 years ago, but which were not identified on the County's zoning maps. As a result, we prepared and filed a supplement to the Application. It consists of a revised Exhibit A-4 map and minor changes to Exhibits A and E. That revised map and exhibits should be substituted for the original A-4 map and Exhibits A and E in the Application. The first planned development is a mixed use area located approximately 1.5 miles north of the generating facility site adjacent to the east side of Avenue 75 East. This conceptually planned mixed use area, designated in 1985, was proposed to be used as a general commercial, RV park, and manufactured home park/residential area although no actual development has occurred.

The proposed transmission line would span a 400- to 500-foot section of the conceptually planned commercial property designated for restaurants and a truck stop. However, the proposed transmission line would not restrict future site access or displace any proposed structures. The conceptually planned mobile home park would be approximately 3/4 mile east of the proposed transmission line.

The second conceptually planned commercial development is located on the west side of Avenue 75 East. No specific plans were identified for this development and the proposed transmission line would not restrict future site access or displace any proposed structures.

Q. How will Allegheny's property that is not required for the generating facility and switchyard be used in the future?

A. The agricultural property in the Harquahala Valley acquired by Allegheny will continue to be farmed using Central Arizona Project ("CAP") water for irrigation purposes. The property adjacent to Centennial Wash will remain desert open space, except for the five well sites to be developed.

Q. Would the Project affect floodplains?

A. No. URS confirmed the location and limits of the Federal Emergency Management Agency designated 100-year floodplain for Centennial Wash as illustrated on Exhibit G-4. The generating facility and evaporation ponds are located outside the 100-year

floodplain and therefore would not result in impacts. Additionally, the evaporation ponds will include design measures such as berms and diversion dikes to ensure that they are not affected in the event of a flood.

Q. Will the generating facility be landscaped?

A. Yes. The perimeter of the generating facility will be landscaped using a mixture of native and non-native tree and shrub species to enhance the aesthetics of the facility. The conceptual landscape plans are shown in drawings attached to this testimony as Exhibits RLS-1.

Q. Based on the analyses conducted, what is your conclusion regarding the Project's impact on existing uses and future land use plans?

A. The Project would be compatible with existing and planned land uses and will not conflict with identified future development plans. Impacts to existing and future development plans would range from low to moderate, respectively.

Q. Was an evaluation of biological resources conducted? If so, please describe the process that was used.

A. Yes, an inventory and assessment of the Project was conducted by URS biologists. The process included reviewing existing material provided by federal and state agencies as

well as field visits in the Project vicinity. Existing materials that were reviewed included aerial photography, topographic maps and review of rare and endangered species lists from the U.S. Fish and Wildlife Service and the Arizona Game and Fish Department. Specific surveys for the southwestern willow flycatcher, Sonoran desert tortoise, and cactus ferruginous pygmy-owl began in the Spring of 2001. These surveys are being conducted in accordance with agency-established guidelines and protocols and will continue until the Spring of 2002. These surveys also included documentation of common plant and wildlife species present in the area. Detailed information concerning these subjects is set forth in Exhibits C and D of the Application.

Q. What is your conclusion regarding the Project's potential impact on biological resources?

A. Results of the biological evaluation indicate that there are no special status or threatened and/or endangered plant or wildlife species on the Project site. While temporary disruption of wildlife in adjacent habitats may occur during construction, this potential is minimal and transient. The plant communities that will suffer loss due to construction are not critical to any species listed by government agencies as species of special concern. Areas of non-developed desert scrub landscapes disturbed during construction and not occupied by the proposed facilities will be revegetated. This may include salvaging existing larger size plant materials and transplanting them after construction of the Project. The proposed facilities would not result in adverse impacts on plant and wildlife species.

Q. Please describe for the Committee the results of the evaluation of cultural resources.

A. The complete technical report is Exhibit B-2 to the Application and the results of the record search are summarized in Exhibit E. Additionally, a cultural resources field survey report completed after the Application was filed is attached to this testimony as Exhibit RLS-2.

Record searches revealed that six archaeological sites have been recorded within the 33 square-mile record search area, but none are located within the footprint of the Project facilities. All of the sites are relatively small and simple and reflect limited aboriginal exploitation of the Harquahala Plain.

The intensive field surveys covering approximately 987 acres identified two sites within the proposed project area consisting of a low-density scatter of prehistoric artifacts. Both of these sites have the potential to be evaluated by the State Historic Preservation Office for archaeological data. Additionally, the field survey identified several isolated occurrences of prehistoric artifacts; none of which were evaluated as having historic values that warrant preservation.

Q. What are your conclusions regarding cultural resources?

A. The two archaeological sites of relative importance could be avoided during the construction of the proposed facilities. In the unlikely event the sites cannot be avoided

during construction, impacts could be minimized by undertaking archaeological testing and data recovery efforts if warranted.

Q. Did you evaluate visual resources associated with the Project?

Yes. URS conducted a visual resource study that included an evaluation of visual conditions including scenic quality and project visibility. Impacts on scenic quality would range from low in the desert scrub landscapes to moderate in the agricultural landscapes. Impacts on views from the nearest residence, approximately 1.75 miles north of the generating facility would be moderate. This is primarily because the residence would be viewing across Interstate 10 and through the existing Palo Verde-Devers 500kV transmission line. Impacts resulting from the transmission line and switchyard would be similar.

Impacts on views from Interstate 10 would be moderate for both the generating facility and transmission line crossing. This is primarily due to the lack of scenic designations along Interstate 10, the relatively short viewing duration and the existing modifications present in the landscape. The closest access point to the Eagletail Mountains Wilderness is located about 4 to 5 miles to the south of the generating facility site. Views of the generating facility would result in low impacts primarily due to partial vegetation screening distance.

Q. Do you have examples of how the Project would appear?

A. Photo simulations were prepared to show anticipated views of the project and are included in the Application as Figures E-2, E-3A, E-3B, E-4A, E-4B and E-5. One mitigation measure noted within the photo simulations is the color of the facility itself. Taking into account the dark backdrop, the color green was applied to the facility to blend with the distant mountains and surrounding vegetation. Additional recommended mitigation measures being considered include landscaping around the generating facility site as I've discussed and directional and shielding devices for light fixtures.

Q. What are your conclusions regarding the visual analysis?

A. The Project would not result in adverse impacts on visual resources after the application of the recommended mitigation measures.

Q. Were potential impacts related to noise and interference with communication signals considered? If so, what conclusions were reached?

A. Noise emission levels and possible interference with communication signals were analyzed for the Project. We concluded that the Project would not result in adverse noise impacts on sensitive receptors within the area. Noise impacts primarily would occur during construction and during steam blows, when ambient noise levels for sensitive receptors may be exceeded; however, these impacts would be short term and efforts

would be taken to minimize the occurrences. Sound levels would not result in an adverse noise impact based upon Federal Transit Administration (FTA) and U.S. Department of Housing and Urban Development (HUD) standards.

Electrical effects of the proposed 500kV transmission line interconnection and switchyard including audible noise and radio and television interference would be minimized by location, design, and construction practices and would not be adverse. Effects due to electrical or magnetic induction are highly unlikely.

Q: Please describe the evaluation of air quality and resources that was conducted.

A: Three main analyses were conducted for air quality. First, a Best Available Control Technology (BACT) analysis was conducted to evaluate currently available control technologies for equipment similar to that proposed for the Project. Next, an emissions inventory was conducted to quantify the maximum predicted ambient impacts due to emissions from the facility for comparison with applicable National Ambient Air Quality Standards, Prevention of Significant Deterioration (PSD) increments and Arizona Ambient Air Quality Guidelines. Finally, visibility impact modeling was conducted to evaluate potential visibility impacts. The air quality studies are contained in Exhibit B-1 to the Application.

Q: What were the results of the BACT analysis?

A: The BACT was evaluated for the combustion turbine generator/heat recovery steam generator units, cooling towers, auxiliary boiler and emergency generators.

The proposed BACT to control emissions from the combustion turbine generator/heat recovery steam generator units consists of dry low-nitrogen oxide burners with selective catalytic reduction, catalytic oxidation for carbon monoxide control, good combustion practices and the use of natural gas as a fuel source, which is inherently low in sulfur content.

The proposed BACT to control emissions from the cooling towers is high-efficiency drift eliminators; the proposed BACT to control emissions from the auxiliary boiler is dry-low nitrogen oxide burners, good combustion practices, and the use of natural gas as fuel; and the proposed BACT for the emergency generators is the use of low sulfur diesel fuel along with good combustion practices.

The proposed BACT will result in emission limits that are equal to or more stringent than other recently permitted facilities that are similar in design to the La Paz Generating Facility.

Q: What were the results of the visibility impact modeling?

A: The final results of the visibility modeling showed that there were no exceedances of the screening criteria for visibility impacts for all of the nearby wilderness areas that were included in the study.

Q: What were the results of the air impact assessment?

A: The air impact analysis showed that the highest impacts among the criteria pollutants evaluated were well below the applicable standards, ranging from 4 percent to 42 percent of the National Ambient Air Quality Standards and from 3 percent to 38 percent of the applicable PSD increments. The Arizona Ambient Air Quality Guidelines analysis also showed impacts well below applicable thresholds, ranging from less than 1 percent to 16 percent.

Q: Has a Title V Air Quality Operating Permit been submitted to the Arizona Department of Environmental Quality (ADEQ)?

A: The La Paz Title V operating permit application is being prepared in conjunction with the facility PSD construction permit. This will be a combined submittal and should be completed and filed in September 2001.

Q: What conclusions have you reached based upon the air studies completed for the La Paz Generating Facility?

A: Construction, operation, and maintenance of the La Paz Generating Facility will not result in adverse impacts on air quality. The generating facility will use BACT to control emissions at levels equal to or below other recently permitted generating facilities of similar design. These emission levels will result in ambient air quality impacts that are well under the applicable standards established by ADEQ and the U.S. Environmental Protection Agency (EPA).

Q: How much water will the Project require for operation and what is the source?

A: The La Paz Generating Facility will use approximately 6,500 acre-feet of water per year. Groundwater will be pumped from a well field to be located about ½ mile southeast of the facility. Allegheny has acquired 2,325 acres of land in the Harquahala Valley; groundwater rights associated with this property will be used to supply water to the generating facility.

Q: Has a water supply study been conducted for the Project?

A: Yes. A water supply study has been conducted and is Exhibit B-3 to the Application. The studies included evaluation of the existing groundwater and site conditions, as well as use

of a numerical groundwater model to evaluate three scenarios established to predict the impacts associated with pumping groundwater for the generating facility.

Q: What were the results of the three water usage scenarios studied?

A: Scenario 1 assumed a baseline case using 1997 rates of groundwater pumpage and recharge. The results for Scenario 1 concluded that over the next 30 years, groundwater levels would decline approximately 20 to 40 feet in the vicinity of the Project's well field but would increase 50 to 70 feet in the southeastern section of the Harquahala Basin.

Scenario 2 considered the baseline conditions described for Scenario 1 along with groundwater pumping from five production wells equivalent to 7,000 acre-feet per year for the project, which would be a "worst case" scenario. The "worst case" scenario, which is highly unlikely, can be characterized as continued pumping of groundwater at current rates, pumping the maximum 7,000 acre-feet per year and no recharge of CAP water. Scenario 2 resulted in an approximate additional 30 feet of decline of water levels after 30 years in the vicinity of the Project's well field and approximately 20 feet of water level decline 3 to 5 miles from the well field.

Scenario 3 considered the conditions modeled for Scenarios 1 and 2 along with groundwater recharge from the Vidler Water Recharge Facility beginning in 2002. Recharge was assumed to range from 5,000 acre-feet per year in 2002 and increase to 70,000 acre-feet per year by 2006 through 2031. Scenario 3 resulted in a net rise in

groundwater levels of approximately 150 to 175 feet in the vicinity of the well field. This effect is expected to extend across the entire Harquahala Basin.

Q: What conclusions can be made based upon the water supply studies completed for the La Paz Generating Facility?

A: The results of the water supply study indicate an adequate supply of groundwater of suitable quality to meet the needs of the La Paz Generating Facility for the projected 30-year life. Even under a "worst case" scenario water level declines would be minimal. It is also likely that the Harquahala Basin will see a net increase in groundwater levels when the Vidler Water Recharge Facility is in operation.

Q: What is the status of the other permits being obtained for the Project?

A: The zoning application for the generating facility site is being discussed with La Paz County and approval is expected in the fall of 2002. The air permit will be filed in September 2001 and approval is expected in August 2002. The acquifer protection permit (APP) will be filed in October 2001 and approval is expected by the Summer of 2001. The BLM land exchange has been initiated and a Record of Decision is expected in the summer of 2002. The right-of-way application for land owned by the Arizona State Land Department will be filed in the Fall of 2001 and approval is expected in the spring of 2002.

Q. In comparison, how do the environmental impacts for the Project relate to those associated with other recently permitted generating facilities of similar design?

A. In relative terms, environmental impacts associated with this Project are below impact levels of other recently permitted generating facilities. There were no high impacts identified and all of the impacts identified are in the moderate to low range. This site is an excellent location for a generation facility. The Project is compatible with existing and future land use plans and would result in low to moderate impacts, respectively. There were no special status or threatened and/or endangered species identified by agencies or in the field surveys; therefore, impacts on biological resources would be low. There were two archaeological sites consisting of a low density of prehistoric artifacts identified in the study area--both of which will likely be avoided during construction and would result in low to no impacts.

Impacts on scenic quality and views would range from moderate to low due to the lack of scenic diversity in the area and existing modifications visible in the landscape. Noise levels from construction may exceed ambient levels; however, those from operation of the generating facility would not. Noise levels would not exceed FTA or HUD standards and would not be adverse.

Emission levels from the generating facility will result in ambient air quality impacts that are well under the applicable standards established by the ADEQ and EPA. There is an

ample supply of groundwater and the pumpage resulting from the Project combined with recharge from the Vidler facility will result in a net increase in current groundwater levels

Q. In summary, what is your opinion as to the environmental impacts that may result from the construction and operation of the Project?

A. Based on the studies URS conducted and other information presented in the Application, the project will result in minimal or negligible environmental effects. Construction, operation, and maintenance of the Project in the manner proposed, together with implementation of applicable mitigation measures, will be effective in minimizing impacts. Further, based on my review of the factors set forth in the siting statute and comparable projects previously reviewed and approved by the Siting Committee and the Arizona Corporation Commission, it is my opinion that the Project would be compatible with the environment.

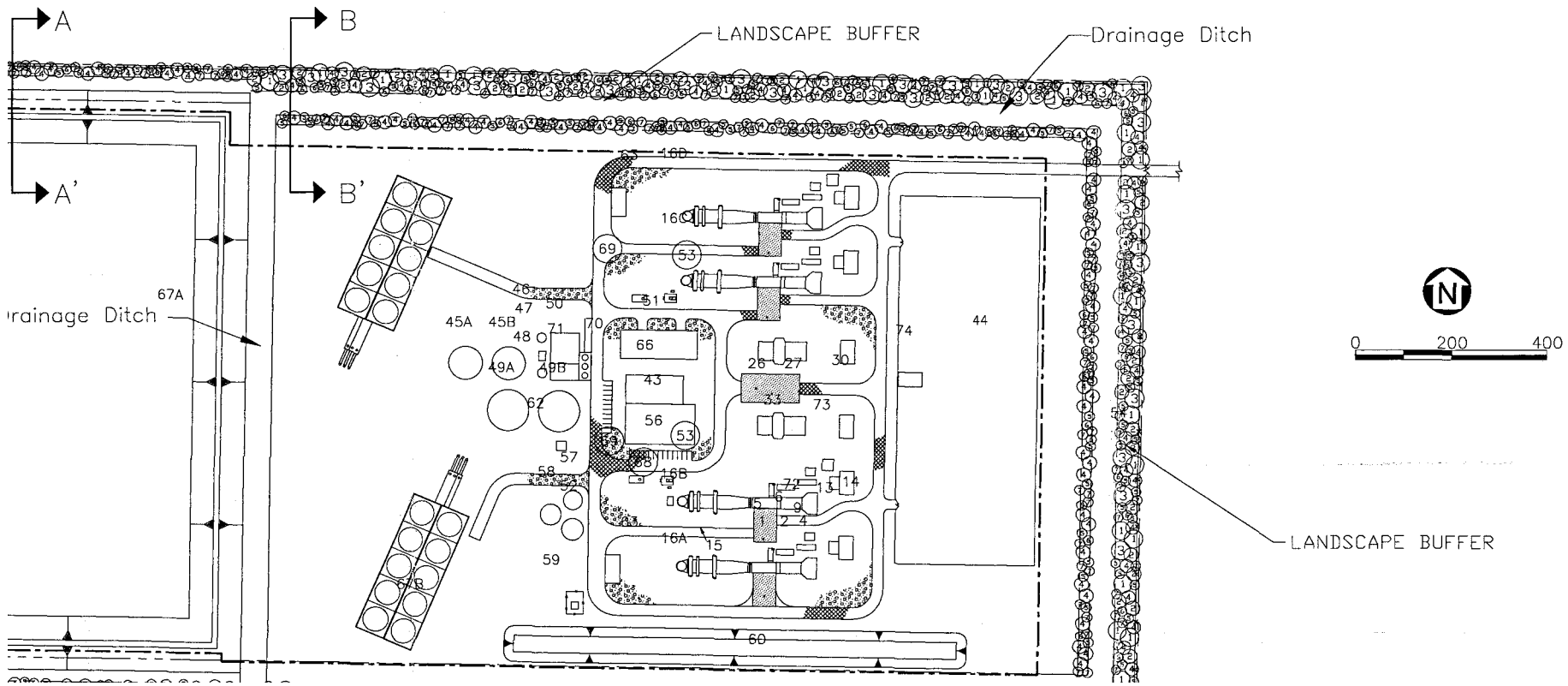
Q. Does this conclude your testimony?

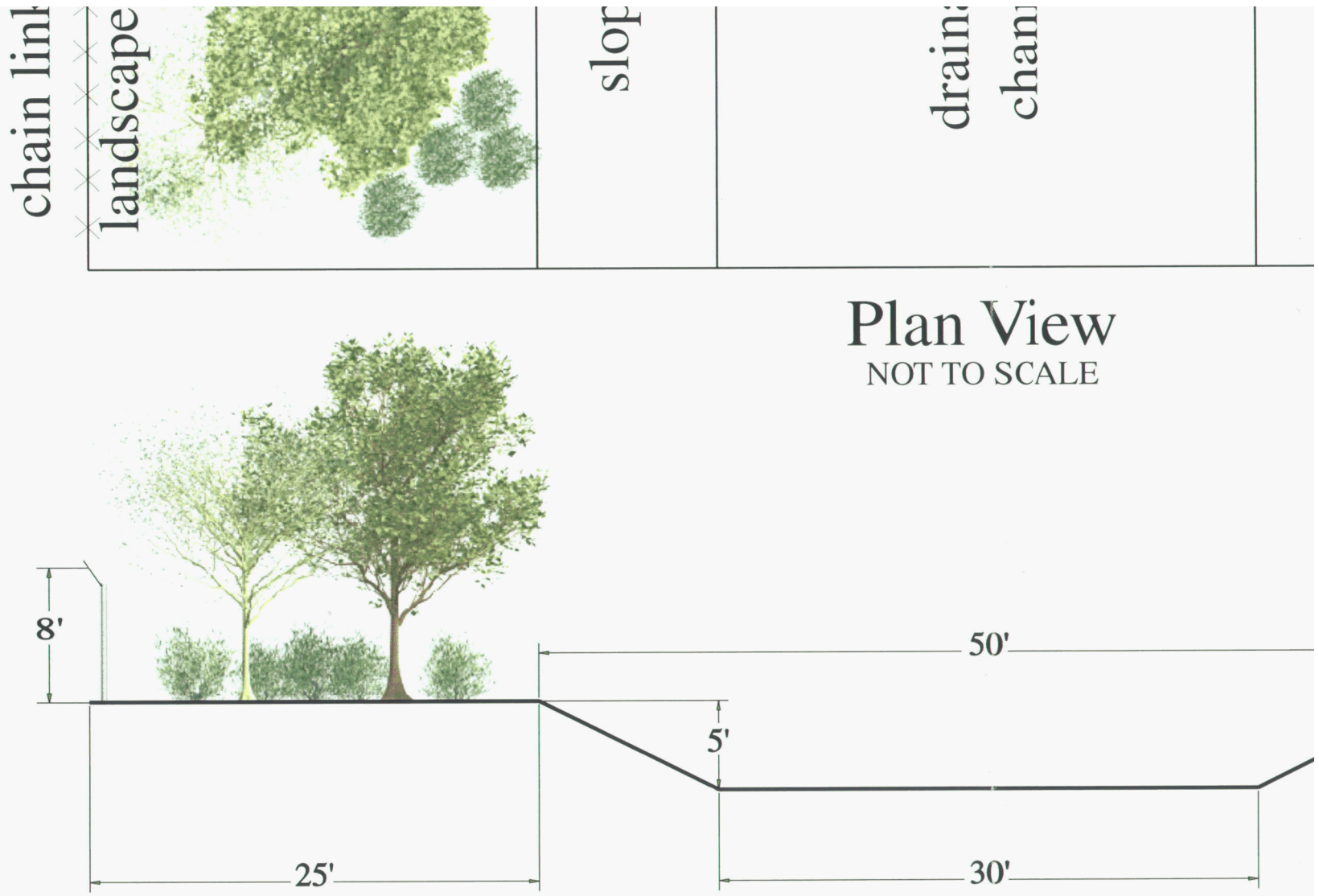
A. Yes, it does.

12921-0003/944591

EXHIBIT RLS-1

e No.	Common Name	Scientific Name	Height	Width	Required # of Plants
	Mondel Pine	Pinus eldarica	50–80 feet	40 feet	50
	Desert Gum	Eucalyptus rudis	40–60 feet	30+ feet	50
	Red Gum	Eucalyptus rostrata	60–100 feet	40+ feet	50
	Ironwood	Olneya tesota	30 feet	25–30 feet	100
	Chilean Mesquite	Propsopis chilensis	30 feet	20 feet	250
	Sonoran Palo Verde	Cercidium praecox	20 feet	20 feet	250
	Desert Sweet Acacia	Acacia smallii	20 feet	20 feet	250
	Creosote Bush	Larrea tridentata	4–6 feet	4–6 feet	250
	Silver–Leaf Cassia	Cassia phyllodenia	6 feet	6 feet	250
	Green Cloud Sage	Leucophyllum frutescens "Green Cloud"	6 feet	6 feet	250
	Texas Sage	Leucophyllum frutescens	6 feet	6 feet	250





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Plan View
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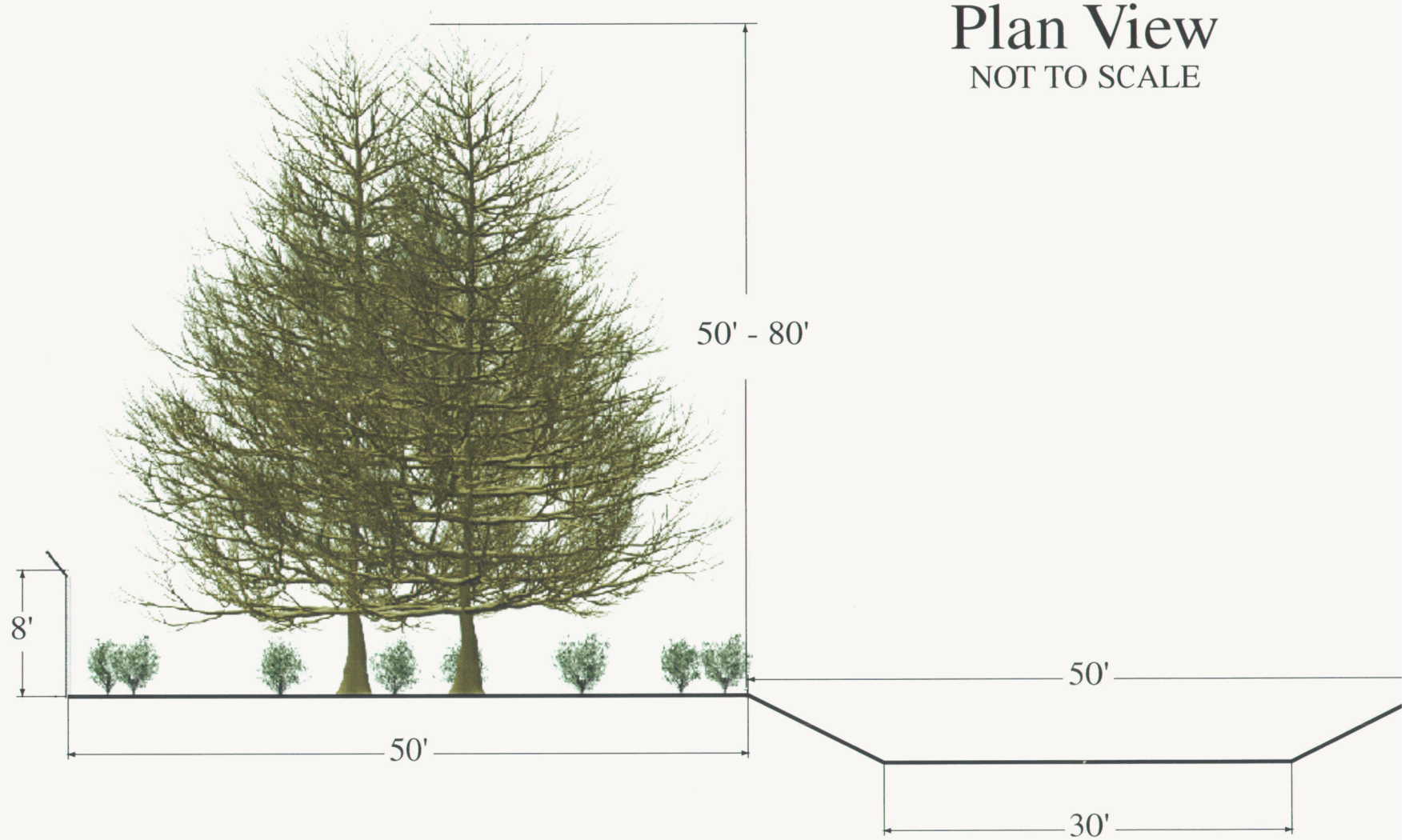

Section B-B'
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EXHIBIT RLS-2

Cultural Resource Survey for the Proposed La Paz Generating Facilities Project, La Paz County, Arizona

prepared for

Allegheny Energy Supply Company

for submittal to

Arizona State Land Department

prepared by

URS

URS Cultural Resources Report 2001-63(AZ)

Restricted Information

August 2001

CULTURAL RESOURCE SURVEY FOR THE PROPOSED LA PAZ GENERATING FACILITIES PROJECT, LA PAZ COUNTY, ARIZONA

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URS Cultural Resource Report 2001-63(AZ)

To prevent vandalism, please restrict information in this report about the location of archaeological sites.

August 2001

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ABSTRACT

Agencies: Arizona State Land Department
Arizona Power Plant and Transmission Line Siting Committee of the Arizona Corporation Commission

Report Title and Date: *Cultural Resource Survey for the Proposed La Paz Generating Facilities Project, La Paz County, Arizona*
August 2001

Project Number: URS Project Number E1-00001722.04

Project Description: The Allegheny Power Supply Company (Allegheny) proposes to construct a power plant and associated facilities approximately 75 miles west of Phoenix. Allegheny retained URS to conduct environmental studies to support their application to the Arizona Power Plant and Transmission Line Siting Committee for a Certificate of Environmental Compatibility (CEC). Additionally, since a portion of their proposed transmission line and pipeline cross portions of Arizona state trust land, the cultural resource studies were intended to support the Arizona State Land Department and Siting Committee in complying with state laws related to protection of archaeological and historical resources.

Allegheny is proposing to construct the La Paz Generating Facility, which includes (1) a 1,080 megawatt power plant, (2) a 500kV interconnect line and switchyard, (3) a well field, and (4) a natural gas pipeline lateral.

Location and Ownership: The project area is located at the boundary between La Paz and Maricopa counties, approximately 75 miles west of Phoenix. The site of the proposed plant and associated facilities is approximately 75 miles west of Phoenix in eastern La Paz County and western Maricopa County. The proposed power plant is located on privately owned land in Section 35, Township (T) 3 North (N), Range (R) 11 West (W), Gila and Salt River Base Line and Meridian. Alternative A of the proposed switchyard is located in Section 25, and Alternative B in Section 26 of T3N, R11W. Both are located on privately owned land. The transmission line alternatives extend south through privately owned and Arizona state trust land from the switchyard locations, in Sections 25, 26, 35, and 36 of T3N, R11W. The well field is located on privately owned land in Section 1, T2N, R11W. The first "leg" of the pipeline, on Arizona state trust land, is oriented east-west just north of the southern section boundary in Section 36, T3N, R11W. The remainder of the proposed pipeline route extends

south through privately owned and Arizona state trust land to the existing El Paso Natural Gas pipeline along the western edge of Sections 2, 7, 18, 19, and 30, T2N, R10W.

The project area, including a 1-mile buffer as part of the Class I research, is depicted on the Lone Mountain, Courthouse Well, Eagletail Mountains West, and Eagletail Mountains East U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles.

Acreage: In total, we surveyed about 987 acres. Approximately 777.5 acres are privately owned land and 209.5 acres are Arizona state trust land.

Survey Permit Number: Arizona Antiquities Act permit number 2001-28bl

Personnel and Dates of Field Survey: Sharon K. Bauer directed the field survey, and was assisted by archaeologists Penelope Taylor Baar, Kim Ryan, and Sebastian Chamorro. The fieldwork was conducted between 16 and 26 July 2001, requiring a total of 25 field-person days of effort. Dr. David E. Doyel served as principal investigator.

Number of Sites: Two archaeological sites and 30 isolated occurrences of archaeological materials were recorded within the surveyed area.

Register Eligible Sites: Sites AZ S:7:48 and 49 (ASM) are large, low-density scatters of prehistoric Hohokam chipped and ground stone, ceramics, and possible fire-cracked rock. Site AZ S:7:49 (ASM) also contains a small rock cluster. Both sites have the potential to yield information about regional subsistence strategies and when they were occupied. Both sites are in good condition, with only slight evidence of modern disturbance. We recommend both sites be considered eligible for listing on the National Register of Historic Places on the basis of their information potential (Criterion D).

Register Ineligible Resources: The 30 isolated occurrences found during the survey are evaluated as having no historic values that warrant preservation. It is recommended they be considered ineligible for the National Register of Historic Places and the Arizona Register of Historic Places.

Recommendations: Two archaeological sites located within the footprint of the proposed facilities are significant because of their potential to yield important

information about the aboriginal settlement and subsistence strategies within the Harquahala Plain. Current design of the proposed facilities, the well field and the natural gas pipeline lateral, indicate that both sites have a high potential to be directly impacted by construction of these facilities.

We recommend that archaeological testing and, if warranted, data recovery studies be designed and implemented to mitigate impacts on both sites. If a need for additional facilities is identified, such as access roads beyond the surveyed areas, additional cultural resource surveys may be warranted.

If any human remains or funerary objects are unexpectedly discovered during project construction, they should be protected and reported immediately to the director of the Arizona State Museum in accordance with Arizona Revised Statutes § 41-865.

ACKNOWLEDGMENTS

We are grateful to Kevin Geraghty of Allegheny for his assistance in puzzling out land ownership in the footprint of the facilities, and for obtaining permission from various land owners to survey across their property.

Randy Simpson and Jaime Wood of URS managed the project and coordinated all the field efforts, and we thank them for their efforts. Sebastian Chamorro and Kim Ryan endured numerous long, hot days in the field. Ron Savage produced all the report graphics, and Keryn Darr edited the report. We appreciate the effort all of these individuals put forth on our behalf.

CHAPTER 1 - INTRODUCTION

The Allegheny Power Supply Company (Allegheny) proposes to construct a power plant and associated facilities approximately 75 miles west of Phoenix. Allegheny retained URS to conduct environmental studies to support their application to the Arizona Power Plant and Transmission Line Siting Committee for a Certificate of Environmental Compatibility (CEC). Additionally, since a portion of their proposed transmission line and pipeline cross portions of Arizona state trust land, the cultural resource studies were intended to support the Arizona State Land Department and Siting Committee in complying with state laws related to protection of archaeological and historical resources. This report documents the results of the cultural resource survey.

PROJECT DESCRIPTION

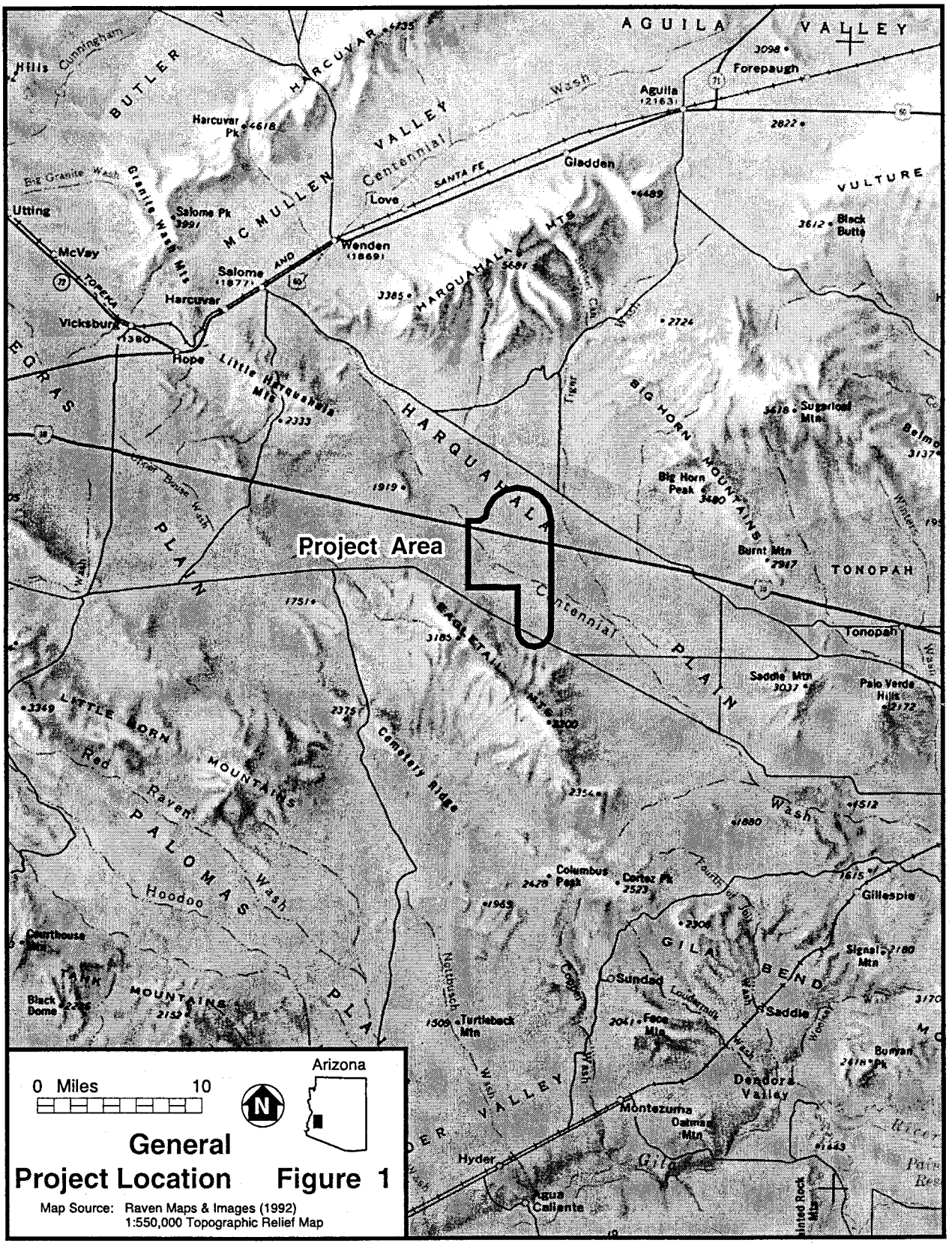
Allegheny is proposing to construct the La Paz Generating Facility. The project includes (1) a 1,080 megawatt power plant, (2) a 500-kilovolt (kV) interconnect line and switchyard that would provide access to the regional transmission grid by linking the plant to the existing 500kV Palo Verde-Devers transmission line, (3) a well field, and (4) a pipeline lateral that would deliver natural gas to the plant site from an existing El Paso Natural Gas (EPNG) pipeline south of Centennial Wash.

Soon after beginning the survey, Allegheny informed us that they were considering a second alternative to the locations of the transmission line and switchyard. Alternative A for each facility is located east of Avenue 75E, and Alternative B is located to the west.

PROJECT LOCATION

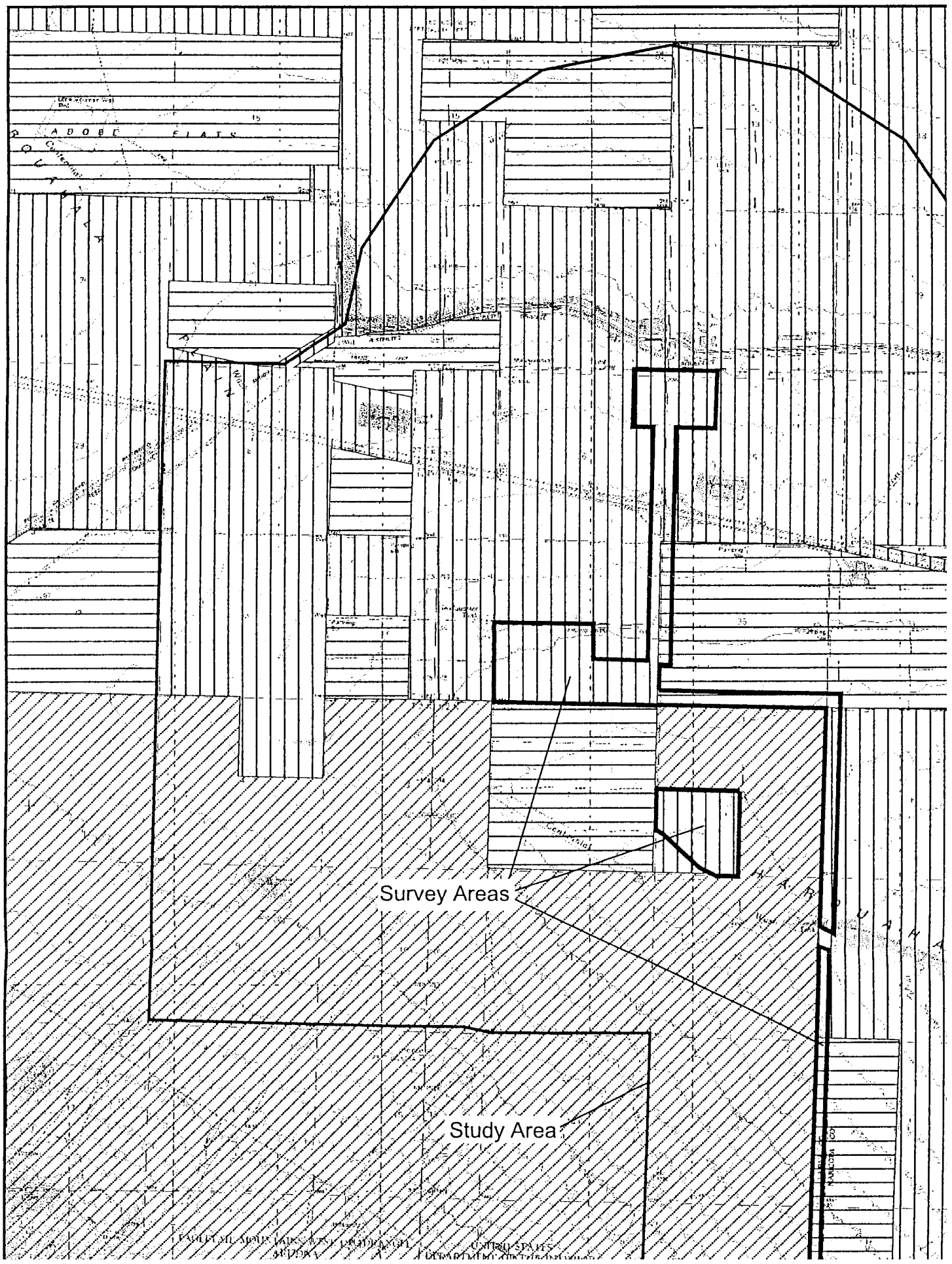
The site of the proposed plant and associated facilities is approximately 75 miles west of Phoenix in eastern La Paz County and western Maricopa County (Figure 1). The proposed power plant is located on privately owned land in Section 35, Township (T) 3 North (N), Range (R) 11 West (W), Gila and Salt River Base Line and Meridian (Figure 2). Alternative A of the proposed switchyard is located in Section 25, and Alternative B in Section 26 of T3N, R11W. Both are located on privately owned land. The transmission line alternatives extend south through privately owned and Arizona state trust land from the switchyard locations, in Sections 25, 26, 35, and 36 of T3N, R11W. The well field is located on privately owned land in Section 1, T2N, R11W. The first "leg" of the pipeline, on Arizona state trust land, is oriented east-west, just north of the southern boundary of Section 36, T3N, R11W. The remainder of the proposed pipeline route extends south through privately owned and Arizona state trust land to the existing EPNG pipeline along the western edge of Sections 2, 7, 18, 19, and 30, T2N, R10W.

The project area, including a 1-mile buffer as part of the Class I research, is depicted on the Lone Mountain, Courthouse Well, Eagletail Mountains West, and Eagletail Mountains East U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles.



General Project Location Figure 1

Map Source: Raven Maps & Images (1992)
1:550,000 Topographic Relief Map


ADOBE FLATS
Survey Areas
Study Area

SCOPE OF SURVEY

The proposed power plant site was defined as an L-shaped parcel encompassing approximately 267 acres (Table 1). The proposed switchyard (Alternative A) was defined as encompassing 10 acres. The transmission line connecting the switchyard with the power plant is approximately 1.75 miles long, and the survey corridor was defined as 500 feet wide. The proposed well field survey block encompasses an entire quarter section (160 acres). The pipeline survey corridor was defined as 200 feet wide.

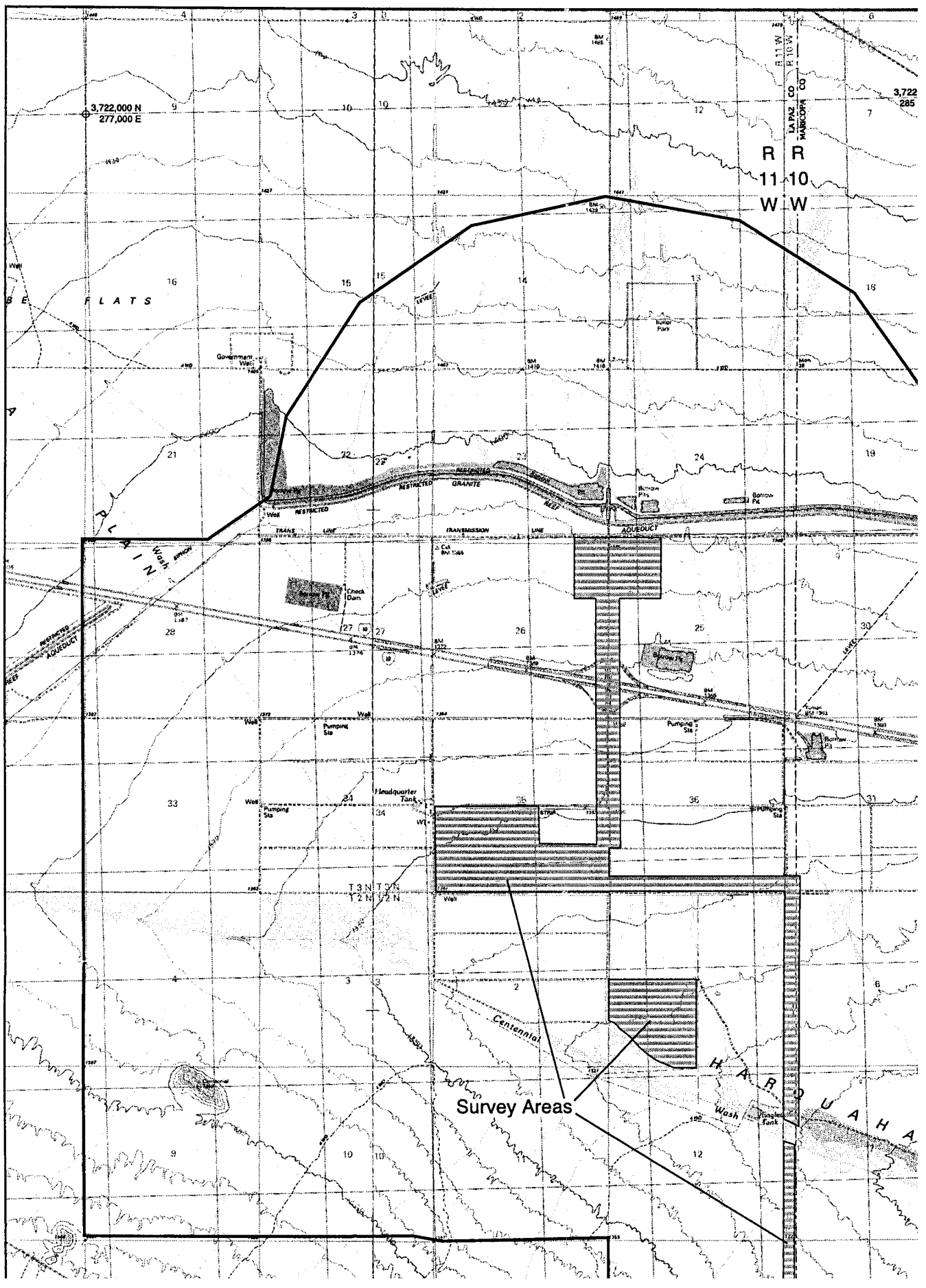
TABLE 1
SUMMARY OF PROPOSED SURVEY ACREAGE

Unit	Length (feet)	Width (feet)	Acres
Power Plant	5,400 3,240	1,350 1,350	267
Well Field	2,640	2,640	160
Switchyard (Alternative A)	660	660	10
Transmission Line (Alternative A)	9,420	500	108
Gas Pipe Line	29,295	200	135
Total			680

For a variety of reasons, the actual acreage surveyed is different than that proposed. For example, although the well field encompasses 160 acres, Centennial Wash extends through the southwest corner of the parcel. Dense mesquite growth along the wash prohibited adequate survey in that area. Additionally, crew size varied between three and four archaeologists during the survey, and reluctance to separate the crew led to larger corridors being surveyed in some areas. Figure 3 illustrates the areas surveyed, and Table 2 summarizes the acreage surveyed for each facility. As mentioned above, there are two alternatives for the locations of the switchyard and transmission line.

TABLE 2
SUMMARY OF ACREAGE SURVEYED

Unit	Length (feet)	Width (feet)	Acres
Power Plant	5,400 3,240	1,350 1,350	267
Well Field	--	--	135
Switchyard (Alternative A)	1,890	1,650	72
Switchyard (Alternative B)	1,840	930	39
Transmission Line (Alternative A)	9,420	500	108
Transmission Line (Alternative B)	9,420	500	108
Gas Pipe Line (north of Centennial Wash)	11,885	460	126
Gas Pipe Line (south of Centennial Wash)	17,410	330	132
Total			**987**


3,722,000 N
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3,722
285
R 11 W
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MARICOPA CO
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W W
BE
FLATS
Government Well
Levee
Burrow Pit
RESTRICTED
GRANITE
REEF
AQUEDUCT
TRANS
LINE
TRANSMISSION
LINE
Wash
Check Dam
Pumping Sta
Headquarter Tank
T3N T2N
T3N T2N
Centennial
Survey Areas
HARQUAHA
Eagle Tank

In total, we surveyed about 987 acres. Approximately 777.5 acres are privately owned land and 209.5 acres are Arizona state trust land.

Sharon K. Bauer directed the field survey, and was assisted by archaeologists Penelope Taylor Baar, Kim Ryan, and Sebastian Chamorro. The fieldwork was conducted between 16 and 26 July 2001, requiring 25 field-person days of effort to complete. Dr. David E. Doyel served as principal investigator.

ENVIRONMENTAL SETTING

Environmental parameters do not determine the course of human history, but can represent significant constraints and opportunities and are important factors to address in interpreting the history of human use of any given region. The environment of the project area is briefly described in this section to provide background and context for understanding the history of human occupation of the area.

Climate

The climate of the project area is hot and arid. Annual precipitation averages only about 6 inches (15 centimeters), and rainfall occurs primarily during intense summer thunderstorms (Sellers and Hill 1974). Mean daily maximum temperatures during July, the hottest month, exceed 106 degrees Fahrenheit (°F) (41° C). The mean daily minimum temperature during January, the coldest month, is 31° F (0° C) (Sellers and Hill 1974).

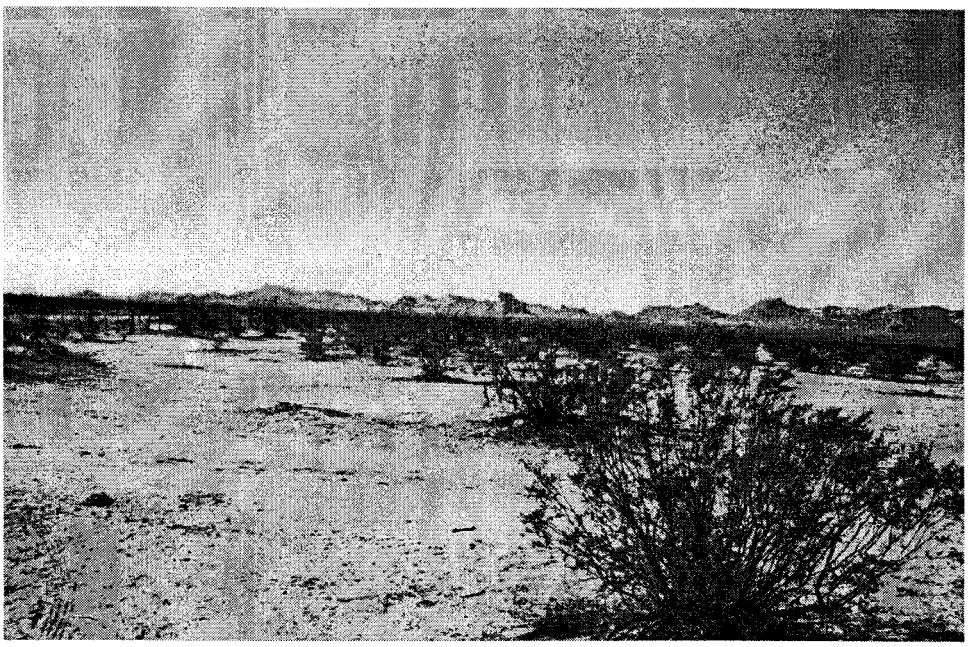
Physiographic Setting

The project is in the Basin and Range Physiographic Province, which is characterized by steep, discontinuous, subparallel mountain ranges separated by generally broad, gently sloping alluvial valleys or basins. The project area is within the Harquahala Plain of the Sonoran Desert section of the Basin and Range Physiographic Province. The Harquahala Plain encompasses approximately 720 square miles (1,865 square kilometers), and lies at elevations of 1,200 to 1,400 feet (365 to 425 meters) above sea level. This valley floor is bounded by the Harquahala Mountains (5,681 feet) to the north, Eagle Tail Mountains (3,186 feet) to the west, Gila Bend Mountains (3,170 feet) to the south, and Big Horn Mountains (3,480 feet) to the east. The cores of these mountain ranges are Precambrian schist, gneiss, granite, and quartzite. Other exposed sedimentary and igneous rock types are dated to the Paleozoic and Mesozoic (Stone 1986).

The Harquahala Valley was formed by erosional processes that created coalescing alluvial and colluvial fans to form a bajada landscape. The valley bottom is covered by deposits of silt, sands, and gravels derived from alluvial fan material as well as floodplain and terrace deposits. The Centennial Wash drains the Harquahala Plain and joins the Gila River in the Arlington Valley. Winters Wash, draining the Tonopah Desert located north of the study corridor, flows south and joins Centennial Wash (Chronic 1983).

Natural Vegetation and Wildlife

The project corridor is within the Sonoran Desertscrub Biome, which encompasses a large, arid region of southwestern Arizona, southeastern California, the Baja peninsula, and the state of Sonora, Mexico (Turner and Brown 1994). Parts of the project area have been intensively farmed (the agricultural fields in the project area now appear to have been abandoned), but the natural vegetation in the rest of the project area is characteristic of the Lower Colorado River Valley Subdivision, which is the hottest and most arid of the Sonoran Biome subdivisions. Creosotebush dominates the vegetation in most of the areas surveyed (Photograph 1). No vegetation was present in the fallow agricultural fields. The washes through the project area are lined with mesquite trees, which are extremely dense along Centennial Wash. Additional vegetation, such as cholla and saguaro, are present in small quantities in the lower bajada north of the Eagletail Mountains.



Photograph 1: Overview of the transmission line corridor, Alternative B, showing creosotebush as the dominant vegetation. Courthouse Rock is in the center of the photo. View is to the south.

Xeroriparian habitats are found in the Sonoran Biome along the dry washes that dissect the area. These intermittent flowing washes support a denser, multi-leveled vegetation including palo verde, ironwood, and mesquite trees, as well as crucifixion thorn, catclaw acacia, burrobush, desert broom, wolfberry, and canyon ragweed.

The coyote is the primary large mammal inhabiting the Lower Colorado River Valley Subdivision. Small burrowing mammal species, common in the sandy area of the creosote-bursage communities, include round-tailed ground squirrel, kit fox, white-tailed antelope squirrel, desert pocket mouse, and kangaroo rats.

Raptors include Harris hawks, red-tailed hawks, and golden eagles. Many unique amphibian and reptile species are present as well, including chuckwalla, rattlesnakes, and desert tortoise. Wildlife is more common along drainages that support xeroriparian habitat, which provides more opportunities for shelter, nesting, and feeding. Larger wildlife, such as mule deer, also may use washes as travel corridors.

CULTURAL HISTORY BACKGROUND

Human use of the region extends back in time 12,000 years or more. Archaeology and traditional oral history provide the only evidence for most of that time period. After Europeans invaded the region written records also were generated, but the project area was never center stage to the focus of regional settlement and details of the history of the area remains sketchy. This section summarizes what is known about the general trends of human occupation of the region.

Pre-Columbian Occupations

For approximately the first 10,000 years that human societies occupied the region, they lived by hunting game and collecting native plant foods. Populations remained small and dispersed. Archaeological excavations during the 1940s at Ventana Cave, located about 90 miles southeast of the project area, provided some of the best stratigraphic evidence in southwestern Arizona of these early Paleoindian and Archaic eras (Haury 1950). More recently, archaeological surveys undertaken prior to construction of the Palo Verde Nuclear Generating Station, Central Arizona Project aqueduct, and Harquahala Irrigation District distribution system resulted in the discovery of additional Archaic Period sites in the general region of the proposed project. Diagnostic late Archaic projectile points, including San Pedro, Amargosa, and Elko corner-notched styles, were found along Centennial Wash in the Harquahala Valley about 10 miles northwest of the proposed project site (Bostwick 1988; Stone 1986). Excavation at some of these sites revealed that they were shallow and the majority of artifacts and features were visible on the surface of the ground. Nevertheless, these sites demonstrate that hunter-gatherers exploited the seasonal plant and animal resources of the deserts of west-central Arizona for thousands of years.

About two to three thousand years ago subsistence strategies shifted to farming crops of corn, beans, squash, and cotton; regional populations grew; and larger, permanent settlements developed. The aboriginal farmers of this era in central Arizona are known as the Hohokam, and they became the most sophisticated canal irrigation agriculturists in North America. Hohokam villages along the Gila River extended west as far as the Gila Bend area to the south of the project area. Other farming societies along the lower Colorado River valley are known as the Patayan culture. Investigations prior to the construction of Painted Rocks Dam northwest of Gila Bend documented a mixture of Hohokam and Patayan sites (Wasley and Johnson 1965).

Some of the villages along the Gila River were quite large, and had public architectural features such as ball courts and platform mounds that probably were the focus of public ceremonies or other communal activities. However, there is little evidence of permanent settlement in the arid upland areas of west-central Arizona away from the Gila River Valley. Archaeological sites in these uplands tend to be surface scatters of artifacts representing briefly used camps and hunting and gathering locations (Brown and Stone 1982). The region was simply too dry to support agriculture except in very unique topographic situations that facilitated floodwater farming, such as along Fourmile Wash below Flatiron Mountain about 15 miles northeast of the project area (Sires 1989).

Ethnohistoric Occupation

When Europeans first arrived in the area, they encountered a diversity of aboriginal groups in what is now southwestern Arizona. The two groups closest to the project area included the Yavapais and Maricopas. The Yuman-speaking Yavapais inhabited west-central Arizona north of the Salt and Gila rivers. A group that came to be known as the Maricopa lived along the lower Gila and Colorado river valleys. During the nineteenth century they migrated up the Gila River to join the Akimel O'odham (Pima), who were village-dwelling farmers living above the confluence of the Gila and Salt rivers. Other desert-dwelling O'odham groups, the Tohono and Hia-Ced, ranged primarily south of the Gila River.

Yavapais

Gifford (1932, 1936) compiled the primary Yavapai ethnography, based on several months of field research in the 1930s. Schroeder (1974) compiled ethnohistoric data for the Yavapai land claims case in the 1950s. More recent ethnographic studies have focused on the Fort McDowell Reservation community (Khera 1977; Mariella 1983). Important early historic accounts include those of an army physician working at Fort Verde (Corbusier (1886), and observations made during General Crook's Indian campaign (Bourke 1891; also see Porter 1986). Khera and Mariella (1983) and Stone (1987:31) have compiled recent summaries of ethnohistoric and ethnographic research among the Yavapai.

Yavapais were often misidentified as Apaches during the ethnohistoric era, and often were referred to as Apache-Mojaves, Mojave-Apaches, or Apache-Yumans. These designations may reflect the cultural similarity of the Yavapais and Apaches, some of the interaction and intermarriage between Yavapais and Apaches (especially the Tonto band), and recognition of the linguistic affiliation of the Yavapais with Yuman speakers to the west (such as the Mojaves).

During the ethnohistoric era, the Yavapais occupied a large, approximately triangular territory stretching from near Flagstaff in the north, southeast to the Globe vicinity, and west to near Yuma. The Yavapai population in the 1860s was estimated to be about 1,500 to 2,000, but tribal oral history indicates this was greatly reduced from pre-contact levels by warfare and disease. Nevertheless, even earlier population densities were probably low, as is typical of hunting and

gathering societies, although the Yavapais also farmed at favorable locations, particularly in more upland areas where streams or springs provided sufficient water. Tribal oral history indicates much more horticultural activity than is generally attributed to the Yavapais. After planting their gardens, the Yavapais would leave to gather and hunt, returning to harvest the crops that had matured.

The Yavapais followed a seasonal round of movement from lowland deserts to upland chaparral and woodlands, to hunt and collect wild plant resources and tend their fields. The Yavapais lived in local groups or "camps" of up to 10 related households, and groups of camps formed bands. The bands were organized into three or four subtribes. The southwestern subtribe, the Tolkapaya, was the closest Yavapai group to the project area. The Tolkapaya periodically traveled to the Colorado River to plant crops, and during the 1850s and 1860s, some families joined the Cocopah after Euroamericans started to invade their territory (Khera and Mariella 1983:41).

During the 1800s, Yavapais were hostile toward O'odham groups living south of the Gila River, and the Hualapais located to the north between the Bill Williams and Colorado rivers. On occasion, the Yavapais also were hostile towards the Tonto Apaches to the east and incidents of "wife-stealing" were reported. However, relations with Apaches generally were cooperative, as they were with the lower Colorado River valley Mojaves and Quechans with whom the Yavapais traded frequently.

Hostilities between Yavapais and Euroamericans originated with the discovery of gold in the Prescott highlands in the 1860s. Some Yavapais were persuaded to move to the Colorado River Indian Reservation, but conflict intensified in the late 1860s. By 1871, the U.S. Army confined about 1,000 Yavapais to the military reservation at Camp Date Creek (Boles 1994). By 1873 the Yavapais were militarily defeated, with perhaps a loss of 15 to 30 percent of the tribal population. The surviving Yavapais were concentrated at Camp Verde, and in 1874 they were marched to the San Carlos Reservation, where they lived with Apaches for about 25 years. A few hundred Yavapais apparently escaped this incarceration and worked as laborers at mines in the Castle Dome Mountains (Bean and Vane 1978:5-70).

By 1900, many Yavapais had moved back to their old homeland along the Verde River, and only about 200 Yavapais remained at San Carlos. The 38.6-square-mile Fort McDowell Reservation was established on the lower Verde River in 1903. A small, 40-acre parcel also was set aside for the Yavapais near Camp Verde in 1910, and through small expansions in 1914, 1916, and in the 1950s, the parcel now totals 635 acres. Another small, 75-acre reservation was established near Prescott in 1935, and enlarged by 1,320 acres in 1956.

Today, there are approximately 800 enrolled members on the Fort McDowell Reservation. About 1,180 enrolled members live on the Camp Verde Reservation parcels, and about 130 enrolled members reside on the Yavapai-Prescott Reservation (Schell 1993).

Maricopas

When Europeans first arrived in the area, the Maricopas resided in the Gila River valley southeast of the proposed project site and used adjacent uplands (Stein 1981a). Spier (1933) conducted the basic ethnographic research of the Maricopas, and subsequent research was undertaken for the Indian Claims Commission (Fontana 1958; Hackenberg and Fontana 1974). Other researchers have investigated the confusing origin of the Maricopas (Bean and Vane 1978; Dobyns and others 1963; Ezell 1963; Harwell 1979; Harwell and Kelly 1983; Kelly 1972).

Spanish accounts are limited and not entirely consistent, but almost 10 Yuman speaking groups were named as living along the lower Colorado River and lower Gila River. Two groups formed a powerful north-south alliance—the Quechans (also called Yumas) residing near the confluence of the Gila and Colorado rivers, and the Mojave who lived farther upstream along the Colorado River.

Numerous other, and apparently smaller, groups were part of a more general east-west alliance. Starting at the Colorado River delta, these groups included the Cocopahs, Halyikwamis, and the Kohuanas all living south of the Quechans, and the Halchidomas situated between the Quechans and Mojaves. Allies along the lower Gila River included the Kaveltcadoms, and farther upriver the Cocomaricopas and the Opas. Some researchers have concluded that Halchidomas, Kaveltcadoms, Cocomaricopas, and Opas were simply geographical units of a single cultural group, which they refer to as the Panya.

The population of the Panya probably was on the order of about 5,000 in the 1700s. The Panya lived in dispersed settlements (*rancherias)*, similar to other Yuman speaking groups along the lower Colorado River. They hunted and exploited wild plant foods, but also fished and farmed with floodwater techniques.

The name "Cocomaricopa" may be the Spanish transliteration of the Akimel O'odham name for a group that lived near modern day Gila Bend—*Kokomalik Aapap*. Aapap means "friendly enemies," a seeming oxymoron that made sense to the Akimel O'odham who lived to the east along the Gila River above the Salt River confluence and were enemies of the two strongest Yuman groups—the Quechans and Mojaves. Kokomalik refers to the Gila Bend Mountains. So, "Maricopa" may be derived from Spanish observers shortening the Akimel O'odham name for the "friendly enemies of the Gila Bend Mountain area." Alternatively, some researchers have suggested that Maricopa evolved from the Spanish word "mariposa," or butterfly, which might have been used to describe the brightly painted Indians.

Whatever its origin, Maricopa was first applied in about 1839 to label an amalgam of the various remnants of the Panya who had absorbed the Kohuanas and Halyikwamais by that time. The groups of Panya had been driven from the lower Colorado and lower Gila River valleys by increased pressure from the Mojaves and Quechans, perhaps stimulated by the arrival of mountain men in search of furs or new markets for slaves in Mexico. The fleeing Panya took up residence in south-central Arizona adjacent to the Akimel O'odham on the Gila River above its confluence with the Salt River and became known collectively as the Maricopa. The Halchidoma first fled to Sonora and resided there for several years before returning to the Gila Valley to join

their relatives. The Maricopas adopted aspects of Hispanic culture, including cattle, horses, mules, wheat, and possibly barley. Some Maricopas spoke Spanish well, serving as interpreters for the Akimel O'odham (Harwell and Kelly 1983:75).

In the 1840s, U.S. Army battalions traveling to California passed through the Akimel O'odham and Maricopa villages, purchasing food from them. After the discovery of gold in California, about 60,000 "Forty-niners" crossed Arizona along this trail, creating a huge market for the Gila River farmers, who raised and sold three crops of wheat during 1849. In the 1850s, travelers on stage lines, including the Butterfield Stage, also took advantage of the "roadside groceries" offered by the Akimel O'odham and Maricopa Indians.

The Akimel O'odham and Maricopas never fought the Americans, and in 1859 the federal government set aside the first reservation in Arizona for their use. The Akimel O'odham and Maricopas, in fact, joined the U.S. Army troops in fighting their common enemies, the Apaches and Yavapais. Despite putting their lives on the line, the Akimel O'odham and Maricopas were ill rewarded. American farmers settled on the Gila River in the Florence and Safford areas upstream of the Akimel O'odham and Maricopas, and began building their own irrigation canals. The Americans diverted so much of the river flows that by 1871 the Akimel O'odham and Maricopa fields were left dry. The natives refer to the subsequent half century as the "years of famine." Some Akimel O'odham and Maricopas moved north to the Salt River, where a reservation was established in 1879, and others moved to the confluence of the Salt and Gila rivers.

Today, the Maricopas continue to reside primarily in two communities. There are approximately 5,400 enrolled tribal members at the 87-square-mile Salt River Reservation, of which approximately 100 are Maricopas (who designate themselves as Halchidhomas) concentrated in the Lehi area. There are approximately 11,600 enrolled tribal members on the 583-square-mile Gila River Reservation, of which about 600 are Maricopas, concentrated in the Laveen area in the northwestern corner of the reservation (Schell 1993).

Euroamericans

The project area was bypassed throughout the more than three centuries of Spanish and Mexican eras. The pace of settlement quickened when the United States acquired the territory at the conclusion of the 1846-1848 Mexican War, but it was not until the late nineteenth century that Euroamericans first established ranches in the general vicinity of the proposed project.

E.H. Winters owned a ranch in the area from 1885 to 1925, and was later memorialized when the town of Wintersburg was established near a well on the ranch (Granger 1983:681). Wintersburg warranted a post office only from 1930 to 1941, and a post office was established in Tonopah in 1934. There was a brief flurry of homesteading activity in the Palo Verde Hills area between the early 1920s and the mid-1940s. The earliest of these homesteaders were World War I veterans who had hopes of receiving government-sponsored aid for irrigation projects. These hopes were never fulfilled, and most attempts to rely on floodwater farming and wells failed. Some attempts at homesteading were fraudulent schemes to acquire lands for speculation (Stein 1981b). Most of

the homesteaders who managed to obtain patents left after establishing their claims. Historic remains of early farming and ranching attempts are relatively abundant on the plains around the Palo Verde Hills. They usually consist of a concrete house foundation slab, an abandoned well, animal pens, and scattered trash (Trott 1974).

Today, portions of the project area remain undeveloped, but other areas are abandoned agricultural fields. To the east of the project area, large parcels of land are being offered for residential development.

CHAPTER 2 - RECORDS REVIEW (CLASS I SURVEY)

Records were reviewed at the following agencies and research institutions:

- State Historic Preservation Office (SHPO)
- Arizona State Museum (ASM)
- Phoenix Field Office of the Bureau of Land Management (BLM)
- State Office of the BLM
- Department of Anthropology, Arizona State University

The goal of the review was to identify prior cultural resource studies and previously recorded archeological and historical sites within approximately 2 miles of the project area. This information has been presented in a separate document prepared prior to the field survey in support of the CEC application (Doyel and others 2001).

PRIOR CULTURAL RESOURCE STUDIES

Archaeological and historical studies have been conducted in support of eight projects within 2 miles of the proposed La Paz Generating Facility (Figure 4; Table 3).

The most extensive studies were conducted during the planning of the Hayden-Rhodes Aqueduct (formerly known as the Granite Reef Aqueduct), a component of the Central Arizona Project. The initial investigation of the feasibility alignment for the aqueduct was a reconnaissance conducted by helicopter (Euler 1968). Subsequently, a 600-foot-wide corridor was intensively surveyed along the feasibility alignment (Kemrer and others 1972). Thirty-two archaeological sites were recorded, but only one of these is within the records search area, and all of the artifacts at this small site were collected. Prior to construction, realignments of Reach 5A of the aqueduct, north of the proposed La Paz Generating Facility, were examined and only isolated artifacts were found (Rogge 1976). Intensive survey of about 3.4 square miles within a flood detention basin, built to protect the aqueduct, discovered 10 archaeological sites (Brown 1976a), and studies of some of those were undertaken to mitigate construction impacts (Brown 1976b; Brown and Stone 1982). Four of those 10 sites are within the records search area, but all are north of the proposed facilities.

The next most extensive surveys in the records search area were conducted for the Palo Verde-Devers 500kV transmission line. In the late 1970s, sample surveys were conducted along alternative routes then being evaluated (Berry 1978). This survey covered about 9,200 acres. We could not determine what part of the records search area was encompassed by this survey, but it apparently involved only a narrow transect along the EPNG pipeline. One archaeological site was recorded by this survey near the southern end of the proposed natural gas pipeline lateral. In the early 1980s, the route of the transmission line selected for construction was intensively surveyed. A total of 159 sites were found along the Arizona segment of the corridor (Carrico and Quillen 1982). None of these sites are within the records search area, although several are just to the west. In the late 1980s, a supplemental survey was conducted for the then proposed but never

Figure 4
Prior Surveys and Previously Recorded Sites

built Palo Verde-Devers #2 line (Swartz and Dongoske 1987). None of the 37 archaeological sites encountered are within the records search area.

TABLE 3
PRIOR STUDIES IN THE VICINITY OF THE LA PAZ GENERATING FACILITIES PROJECT

Project Name	Scope	Sites	Reference
Granite Reef Aqueduct, Central Arizona Project surveys ASM 1972-5	1968: helicopter reconnaissance; 1972: 600 ft x 182 mi (12,236 acres); Rogge 1976: 225 acres; Brown 1976a, 1976b: 2,150 acres	1972: 32 sites, AZ S:7:5 (ASM) in project vicinity, 1976: 10 sites, 4 in project vicinity: AZ S:7:8 (ASU) AZ S:7:9 (ASU) AZ S:7:10 (ASU) AZ S:7:11 (ASU)	Brown 1976a, 1976b Brown and Stone 1982 Euler 1968 Kemrer and others 1972 Rogge 1976
El Paso Natural Gas Company West Coast/Mid-Continent Pipeline Project ASM 1976-6	90 acres	none	Lensink 1976
Palo Verde to Devers transmission line alternate corridors survey BLM 10-84, MNA-A76-47	~9,200 acres	25 sites, AZ S:11:3 (ASM) in project vicinity	Berry 1978
Palo Verde to Devers transmission line survey ASM 1981-159	200 ft x 110 mi (2,667 acres)	159 sites, none in project vicinity	Carrico and Quillen 1982
Palo Verde-Devers #2 transmission line survey	597 locations along 110-mile-long route	37 sites, none in project area	Swartz and Dongoske 1987
Kingman to Mobile Pipeline survey ASU 20-80	100 ft x 207 mi (2,509 acres)	24 sites, none in project vicinity	Henss 1983
All American Pipeline survey ASM 1985-26, BLM 9-58/10-182	200 ft x 240 mi (5,818 acres)	32 sites, none in project vicinity	Batcho 1985 Higgins and Brunson 1985
U.S. Telecom fiber optic cable ASM 1987-222	862 acres	none	O'Brien and others 1987
ADOT Avenue 75E/I-10 disposal parcel survey ASM 1996-93	75 acres	none	Stone 1996
Harquahala Valley road survey ACS 00-79A	11 acres	none	Crownover 2000

An ethnographic study also was conducted in support of the planning of the Palo Verde-Devers transmission line (Bean and Vane 1978). Maricopas and Yavapais who were interviewed identified traditional cultural associations with the Little Horn Mountains, Eagletail Mountains, and Courthouse Rock. Yavapais also identified plants traditionally used for food and medicine in the creosotebush vegetation communities of the Ranegras Plain and Harquahala Plain. The proposed La Paz Generating Facility is on the Harquahala Plain and will result in some disturbance of native vegetation although much of the project area already has been altered by agricultural development. The project is not expected to have impacts on any of the other places identified as having traditional cultural associations.

Several other surveys have been conducted for pipeline projects. One was for the EPNG West Coast/Mid-Continent pipeline through the southern part of the records search area. This survey encompassed nine 10-acre plots, but only one of these was in the records search area. The survey found no archaeological or historical sites (Lensink 1976). Henss (1983) surveyed a corridor parallel to the EPNG pipeline for a once proposed but never built Provident Energy Company pipeline. Twenty-four archaeological sites were recorded along the corridor, but none are in the records search area. Another survey was conducted parallel to the EPNG pipeline for the All-American Pipeline. Thirty-two archaeological sites were found along a 240-mile-long segment across southwestern Arizona, but none are in the records search area (Batcho 1985; Higgins and Brunson 1985).

Another survey was conducted for a U.S. Telecom fiber optic cable right-of-way along Interstate 10 (O'Brien and others 1987). Stone (1996) surveyed a 75-acre parcel east of the intersection of Interstate 10 and Avenue 75E. Crownover (2000) surveyed approximately 1.5 miles of road right-of-way along Avenue 75E south of Interstate 10 at Exit 69. None of these surveys found any archaeological or historical sites within the records search area.

PREVIOUSLY RECORDED CULTURAL RESOURCES

Only six archaeological sites have been recorded within the records search area (Table 4, refer to Figure 4). None are within the footprint of the proposed project facilities.

All of the sites reflect aboriginal use of the area, but none of the sites yielded materials that could be chronometrically dated. The Gila Butte and Santa Cruz ceramics at site AZ S:7:10 (ASU) suggest a date of occupation between approximately A.D. 700 and 900 (Dean 1991) and the Colorado Beige ceramics at site AZ S:11:3 (ASM) can be dated between about A.D. 700 and 1050 (Waters 1982). One site also has some historic era trash of undetermined origin.

The sites are all quite simple, consisting of only a few artifacts and simple rock alignments that may be remnants of temporary shelters or rock clusters, some of which may be remnants of hearths or cooking pits. Some hearths or pit features might have buried deposits, but the sites are primarily confined to the surface of the ground and extensive buried archaeological deposits have not been found at these types of sites. As a group, the sites seem to reflect sporadic exploitation of the natural resources of the region, and probably are related to hunting game or collecting and processing indigenous plant foods such as mesquite and palo verde seeds and cactus fruits. Other types of archaeological sites reported in the region include petroglyphs and trails visible across areas of desert pavement, as well as historic trash dumps and remnants of historic farmsteads.

Site AZ S:11:3 (ASM) is depicted as being present at the southern end of the proposed pipeline, but we did not encounter any indications of it. The site was described as a scatter of about two Lower Colorado Beige sherds from a single vessel, and one piece of flaked stone (Berry 1978). One sherd was collected at the time of recording, presumably to facilitate type identification in the laboratory or office. The site actually might be located just east of our survey corridor.

TABLE 4
PREVIOUSLY RECORDED SITES IN THE VICINITY OF THE LA PAZ GENERATING FACILITIES PROJECT

Site Number	Description	Status	Reference
AZ S:7:5 (ASM)	scatter of ground stone tool fragments (manos and metates) and rock clusters	all artifacts collected	Kemrer and others 1972
AZ S:7:8 (ASU)	two concentrations of apparently thermally altered cobbles, 5 ground stone fragments (metates)	avoided and not further studied	Brown 1976a, 1976b
AZ S:7:9 (ASU)	semi-circular cobble alignment, no artifacts	data recovery studies completed	Brown 1976a, 1976b
AZ S:7:10 (ASU)	scatter of 86 ceramic sherds (Gila Plain, Gila Butte Red-on-Buff, and Santa Cruz Red-on-buff), 7 manos, 3 pieces of flaked stone; historic trash	sherds collected; site avoided and not further studied	Brown 1976a, 1976b
AZ S:7:11 (ASU)	semi-circular cobble alignment, 4 pieces of ground stone, 8 ceramic plain ware sherds and 2 pieces of flaked stone	data recovery studies completed	Brown 1976a, 1976b
AZ S:11:3 (ASM) AZ S:11:2 (MNA) NA 14,787 AZ S:11:5 (BLM)	scatter of ~20 ceramic sherds (Lower Colorado Beige, single vessel) and 1 piece of flaked stone	1 sherd collected, no further study	Berry 1978

SURVEY EXPECTATIONS

The records search revealed archaeological and historical resources are not abundant in the vicinity of the proposed La Paz Generating Facility. Only six archaeological sites have been recorded within an aggregate of about 4 square miles that have been surveyed. The archaeological sites that were found are all relatively small and simple, reflecting limited aboriginal exploitation of the Harquahala Plain.

Although the prior archaeological and historical studies have encompassed very little of the footprint of the proposed La Paz Generating Facility, they constitute approximately a 10 percent sample of the records search area. The prior studies may not be a fully representative sample, but the six recorded archaeological sites suggest an average of about one to two archaeological sites per square mile can be expected. The footprint of all the project facilities would encompass 1.5 to 2.0 square miles. Therefore, it can be estimated that about one to four archaeological sites might be present within the footprint of the project facilities.

To gauge the potential for Euroamerican resources, historic maps of the project area were reviewed. The project area overlaps parts of four townships—T2 and 3N and R10 and 11W. The General Land Office (GLO) first surveyed T2N, R10W and T3N, R11W in 1914. T3N, R10W

was surveyed in 1915. The GLO did not survey T2N, R11W until 1934. These relatively late dates reflect the lack of interest in settlement and development of this arid, remote area.

Few cultural features are depicted on the GLO plats of these townships. A dry well is shown about 2 miles north of Centennial Wash in Section 5 of T2N, R10W. The well is not associated with any roads or other cultural features and probably reflects ranching activities. There are five road segments depicted on the 1914 and 1915 plats. One of these follows Centennial Wash, and three of the four others generally extend in a parallel northwest-southeast direction. Only one of these is named, and it is identified as extending between Phoenix and Harrisburg. Harrisburg was a mining town on the north side of the Harquahala Mountains. The town (originally known as Oroville and then Centennial, and finally Harrisburg) warranted a post office from 1880 to 1906 (Granger 1983:290). Captain Charles Harris and his partner Frederick A. Tritle operated a five-stamp mill in Harrisburg to process ore from nearby mines.

Another mining camp known as Harquahala, at the southwestern end of the Harquahala Mountains, was located along the road to Harrisburg about 15 miles north of the proposed site of the La Paz Generating Facility. This camp "boomed" in 1888, but most of the claims were exhausted in less than a decade. The community had a post office from 1891 to 1918, but sporadic mining continued in the area until about 1932 (Granger 1983:290).

The 1934 survey for T2N, R11W depicts two houses and what appears to be another outbuilding where Centennial Wash crosses the boundary of Sections 1 and 2. Potable water probably could have been obtained from relatively shallow wells at this location. No roads are shown as providing access to these buildings, but a road undoubtedly extended along Centennial Wash. There are numerous other unnamed road segments shown in the area south of Centennial Wash and north of the foothills of the Eagletail Mountains. No cultural features are shown along these roads, which probably supported ranching activities.

The early GLO plats indicate little historical development of the region. Only two cultural features are within the footprint of the proposed La Paz Generating Facility. One of the houses depicted on the 1934 plat is within the proposed well field. It is not known whether any evidence of this building remains intact. The natural gas pipeline would cross the alignment of the unnamed road that was depicted on the 1914 GLO plat extending along Centennial Wash. Floods very well may have obliterated evidence of this road at this crossing.

In summary, if significant archaeological or historical sites are present in the well field or along the transmission line corridor, there is good potential to avoid direct impacts by minor project design modifications. If significant resources could not be avoided, those impacts could be mitigated by undertaking studies to recover important information prior to construction.

CHAPTER 3 – FIELD SURVEY (CLASS III SURVEY)

FIELD SURVEY METHODS

The survey crew identified the project area and survey units using 7.5-minute USGS topographic quadrangles and an aerial photograph of the project area (Figure 5). The three- to four-person team of archaeologists inspected the entire survey parcel by walking observational transects at intervals of 65 feet (20 meters) or less. The survey area was relatively flat and easily traversed. Vegetation was generally sparse, making it easy to inspect the ground surface for artifacts and features.

A GeoExplorer II global positioning system (GPS) unit was used to map the corners of the survey areas, prominent roads, survey markers, and sites and isolated occurrences of cultural materials. This system has an accuracy of ±5 meters with differential correction.

ASM guidelines were used in designating archaeological sites and defining their boundaries. ASM Administrative Rules (Chapter 8-201.A.3) implementing the Arizona Antiquities Act (ARS 41-841, et seq.), define an archaeological site as:

> any area with material remains of past Indian or non-Indian life or activities that are of archaeological interest, including without limitation, historic or prehistoric ruins, burial grounds, and inscriptions made by human agency.
>
> The ASM Site Recording Manual (version 1.1, page A-7) defines remains of archaeological interest as one or more archaeological features, which are, in turn, defined as:
>
> Physical remains of past human activity which are at least 50 years old and which are distinguished by boundaries that are based entirely on observable variations in the spatial distribution of the remains. Features include passive accumulations of artifacts, such as artifact concentrations, as well as purposeful constructions, excavations, or deposits.

An artifact concentration is defined as "thirty or more artifacts within an area measuring no more than 50 feet (15 meters) in diameter, except in cases where the artifacts clearly originated from the same item."

Additional guidance is provided by an ASM letter dated 1 October 1994 that identifies other situations that may warrant designations as an archaeological site, including the following:

- 20 or more artifacts, including at least two classes of artifact types within an area 15 meters in diameter
- one or more archaeological features in temporal association with any number of artifacts
- two or more temporally associated archaeological features without artifacts

The ASM guidelines also recognize that other particular circumstances may warrant designation as an archaeological site, and encourage archaeologists to use professional judgment to make appropriate field decisions.

When sites were located, ordinarily they were only briefly examined and marked and the surveyors proceeded to complete the walkover of the entire survey parcel. The crew then returned to undertake more detailed recording, using ASM site forms as the primary documentation. Recording procedures included the following:

- intensively inspecting the site surface to identify features and define site boundaries
- making detailed surface observations about artifact numbers, types, and distribution
- preparing site sketch maps
- taking photographs and illustrating potentially diagnostic artifacts

No artifact collections were made and no subsurface testing was undertaken during the survey.

Findings of cultural materials resources that did not meet the criteria for designation as archaeological sites were recorded as isolated occurrences. Complete descriptions of isolated finds, including artifact types and materials, were recorded and their locations were plotted using the GPS unit.

SURVEY RESULTS

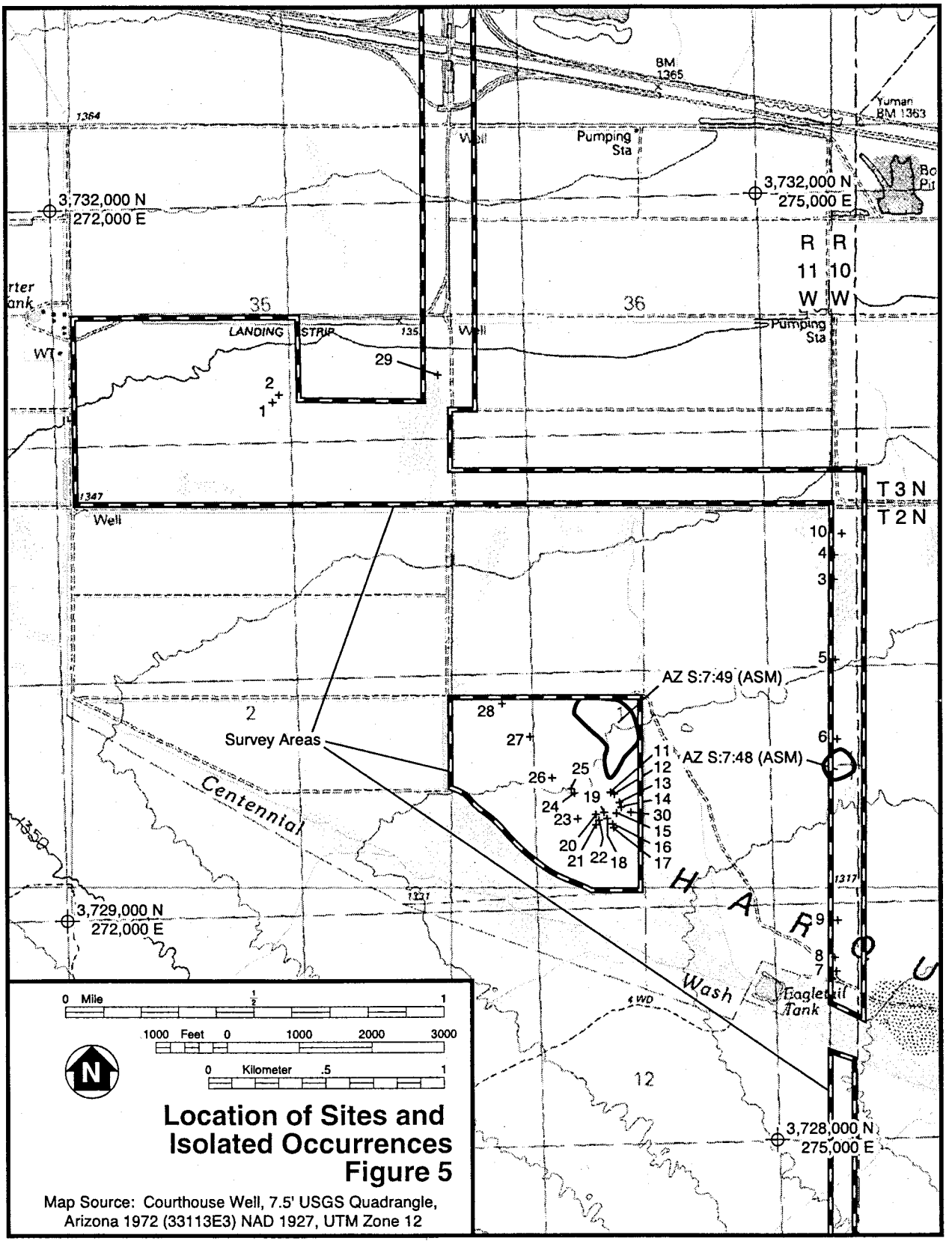
The survey crew found and recorded two prehistoric archaeological sites and 30 isolated occurrences of archaeological materials (Figure 5). The following sections describe and evaluate these resources. Completed ASM site cards for sites AZ S:7:48 and 49 (ASM) are provided in Appendix A.

Site AZ S:7:48 (ASM)

Site AZ S:7:48 (ASM) is a large, low-density scatter of prehistoric artifacts (Figure 6) located on privately owned land in Section 6, T2N, R10W (Courthouse Well 7.5-minute USGS quadrangle, 1990 provisional edition). The Universal Transverse Mercator (UTM) coordinates for the site datum are N 3713598, E 283282.

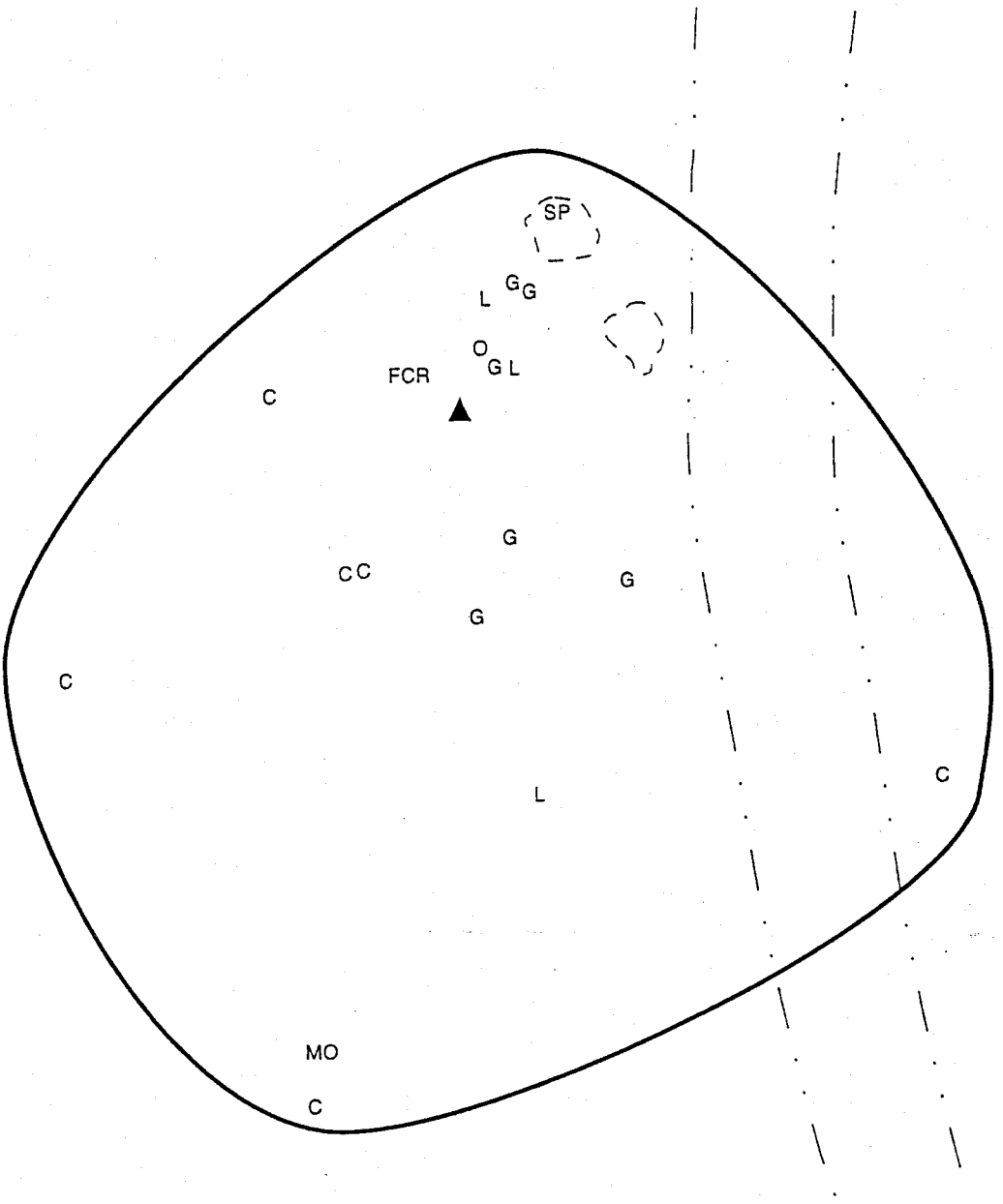
Environmental Setting

The site is situated on the Harquahala Plain less than 1 mile north of Centennial Wash at an elevation of 1,323 feet above sea level. It is bounded on the east by a narrow, shallow erosional



Location of Sites and Isolated Occurrences
Figure 5

Map Source: Courthouse Well, 7.5' USGS Quadrangle, Arizona 1972 (33113E3) NAD 1927, UTM Zone 12



N

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Site Boundary

Artifact Concentration Boundary

Shallow Ephemeral Wash Boundary

C	Ceramic
G	Ground Stone
O	Tested Obsidian Nodule
L	Lithic
FCR	Fire-cracked Rock
MO	Mano
SP	Scraper
▲	Datum

Map of Site AZ S:7:48 (ASM) Figure 6

channel lined by occasional mesquite trees. The surface of the site has been slightly affected by recent flooding of Centennial Wash.

Surface Observations

Site AZ S:7:48 (ASM) encompasses an area measuring approximately 130 meters by 130 meters (about 4 acres). Artifacts observed include chipped and ground stone, ceramics, and possible fire-cracked rock (FCR). No diagnostic artifacts or features were observed.

We tallied all artifacts identified on the site surface. Chipped stone artifacts include one brown chert thumbnail scraper, one obsidian tested nodule, one chert flake and two rhyolite flakes. Ground stone includes four metate fragments and two indeterminate fragments of vesicular basalt. Seven additional vesicular basalt fragments that might be FCR were counted. We counted 54 sherds on the site surface, 35 of which are buff wares. Additionally, we identified 15 sand-tempered plain ware sherds and 4 red-on-buff sherds. Unfortunately, the red-on-buff sherds were so eroded, design types could not be discerned. Because many of the sherds are very small, some of the buff wares might actually be unpainted fragments of red-on-buff vessels. The total artifact count represents a density of only 0.004 item per square meter.

Evidence of Site Age and Function

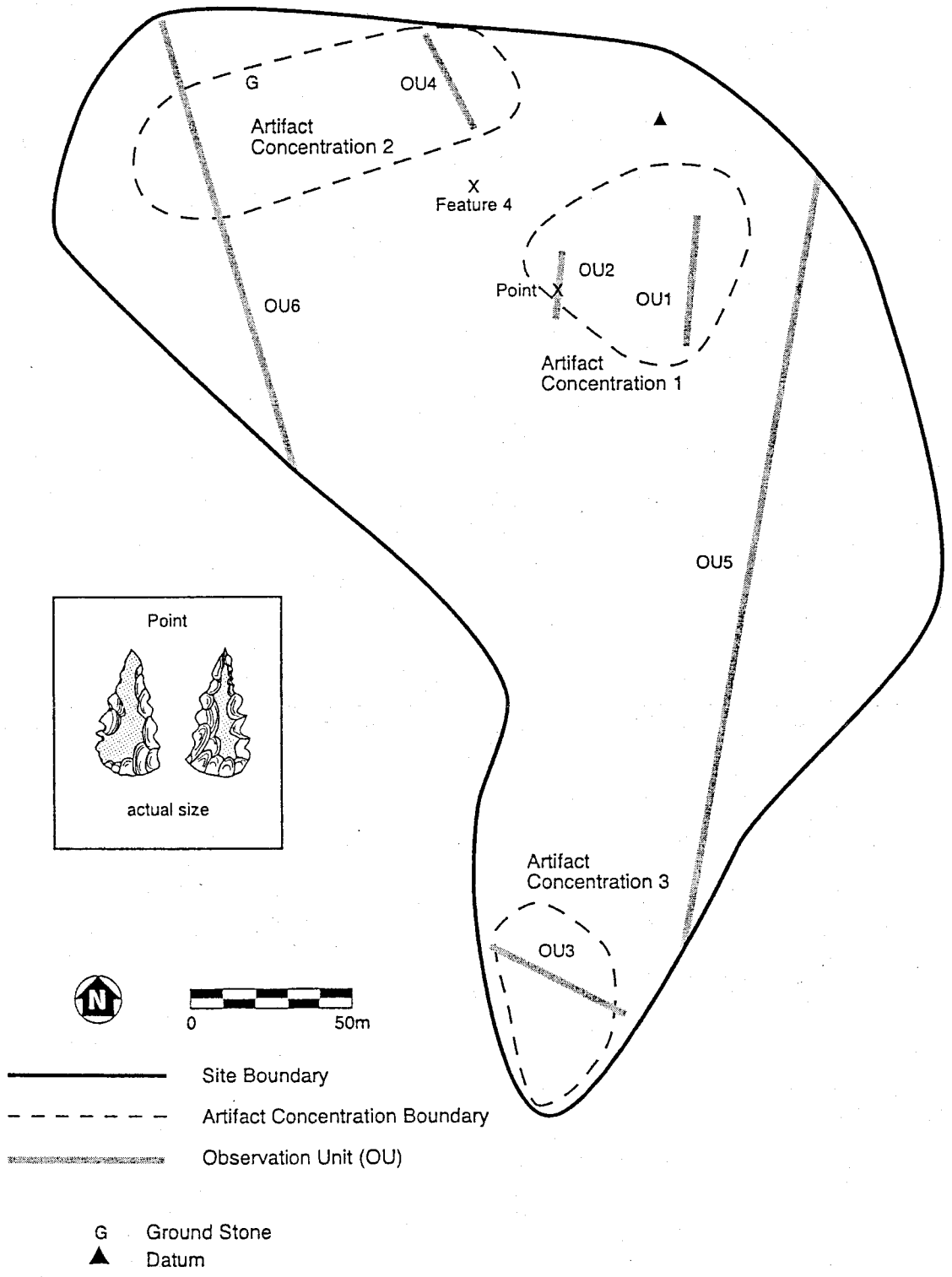
The ceramics within the assemblage indicate a Hohokam presence, although we were unable to define specific types during the survey and so are unable to assign the site to a definite time period. The diversity of artifact types suggests procurement of native plant resources and processing activities were pursued in this location, which is likely considering the proximity of the site to Centennial Wash.

National Register Assessment

The site is in good condition, with just slight evidence—a faded two-track extending through the site—of modern disturbance. Although the site exhibits a low density of surface artifacts, it is possible that additional deposits of cultural materials and cultural features have been buried due to flooding of the wash. Collection and laboratory analysis of the ceramic artifacts have the potential to place this site in a temporal framework, and additional study of the entire assemblage might further define the site's function. Archaeological testing might reveal subsurface deposits and features. Therefore, we recommend site AZ S:7:48 (ASM) be considered eligible for listing on the National Register of Historic Places (National Register).

Site AZ S:7:49 (ASM)

Site AZ S:7:49 (ASM) is a large, low-density scatter of prehistoric artifacts and a possible rock cluster (Figure 7). It is located on privately owned land in Section 1, T12N, R11W (Courthouse



Map of Site AZ S:7:49 (ASM) Figure 7

Well 7.5-minute USGS quadrangle, 1990 provisional edition). UTM coordinates for the center of the site are N 3713760, E 282380.

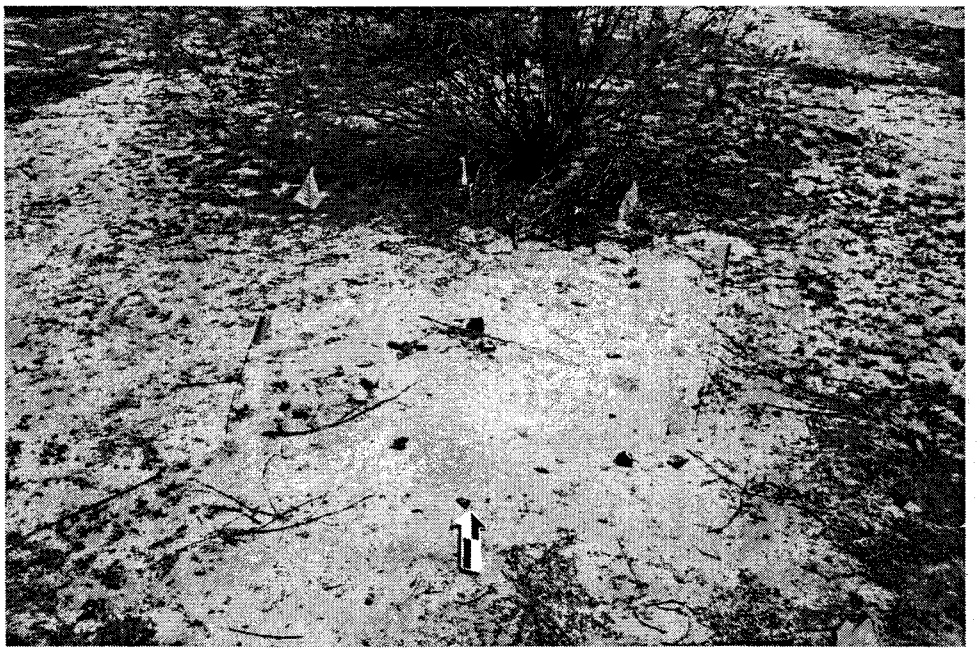
Environmental Setting

The site is situated on the Harquahala Plain less than 0.5 mile north of Centennial Wash at an elevation of approximately 1,330 feet above sea level. The site has been slightly affected by cattle grazing, and shows evidence of having been fairly recently covered by flood waters from Centennial Wash.

Surface Observations

Site AZ S:7:49 (ASM) measures approximately 200 by 330 meters (about 16 acres). Artifacts observed include chipped and ground stone, ceramics, and possible FCR. A single feature, a small rock cluster, was identified near the northern edge of the site.

Feature 1 consists of a small cluster of locally available cobbles measuring 0.5 by 1.0 meter (Photograph 2). There are 35 to 40 small vesicular basalt, granite, and rhyolite cobbles, as well as a few pieces of an unidentified rock type. Many of the rocks exhibit angular breaks and several might be fire-cracked. No soil staining was observed either within or around the feature, and no artifacts are in close association. The cluster is somewhat dubious as a cultural feature, but is distinctive in being the only such cluster of rock in the site, or in this area just north of Centennial Wash. Because no soil staining, ash, or charcoal was observed in or near the feature, its function is unknown.



Photograph 2: Rock Cluster, Feature 1, Site AZ S:7:49 (ASM).

We defined three surface artifact concentrations on the basis of slightly higher observed densities. Concentration 1, measuring approximately 55 by 65 meters (3,575 square meters), is located in the north-central portion of the site. We placed two observation units (OUs) through this concentration to estimate surface artifact density. OU 1, measuring 1 by 45 meters, contained 68 surface artifacts, representing an artifact density of 1.51 items per square meter. OU 2, measuring 1 by 25 meters, contained 65 surface artifacts, representing an artifact density of 2.6 items per square meter. Based on the average density represented by these two observation units (2.055), we estimate Concentration 1 contains between 7,000 and 7,500 artifacts.

Concentration 2, measuring about 35 by 120 meters (4,200 square meters), is located in the northwestern portion of the site. We placed a single observation unit through the eastern end of the concentration. OU 4, measuring 1 by 35 meters, contained 19 surface artifacts, representing an artifact density of 0.54 item per square meter. Although this OU did not extend lengthwise through the concentration, and therefore might not be entirely representative of the concentration as a whole, its density suggests Concentration 2 might contain as many as 2,300 artifacts.

Concentration 3, measuring approximately 40 by 60 meters (2,400 square meters), is located in the southern tip of the site. We placed one observation unit through this concentration. OU 3, measuring 1 by 45 meters, contained 35 surface artifacts, representing an average density of 0.78 item per square meter. This density suggests Concentration 3 might contain between 1,700 and 2,000 artifacts.

Two observation units were placed across the site outside of apparent concentrations. OU 5, measuring 1 by 245 meters, was placed through the eastern portion of the site. OU 6, measuring 1 by 150 meters, was placed through the western portion of the site. Both OUs contained five surface artifacts, representing average densities of 0.02 and 0.3 item per square meter, respectively. These densities suggest there might only be between 1,000 and 1,200 artifacts on the site surface outside of the concentration. In total, the site might contain between 12,000 and 13,000 artifacts. Despite the observation units, however, this estimate seems to be a bit high in comparison to the apparent numbers of artifacts observed during our recording of the site.

Ceramic artifacts dominate the artifact assemblage, but the types are limited. We observed just a few types, including Gila Plain, Gila and Salt varieties, and a type of red-on-buff ware. The decoration on the red-on-buff sherds is very faint, so we were unable to more precisely type this ware. A small number of buff ware sherds were identified, but these might simply be very small, unpainted red-on-buff sherds.

Chipped stone artifacts include flakes of various colored cherts, purple andesite, grey rhyolite, quartzite, and basalt. We also identified three purple andesite cores and a small, serrated obsidian projectile point. The projectile point is located at the southwestern edge of Concentration 1. The ground stone artifacts are of vesicular basalt, and although most items are fragments of larger tools, such as metates and manos, we identified two small, complete, one-handed manos near the northern edge of the site. One of the manos is quartzite and the other is fine-grained basalt. Possible FCR is scattered across the site, and is predominantly of vesicular basalt and granite.

Evidence of Site Age and Function

The ceramics within the assemblage indicate a Hohokam presence, but they exhibit such a wide temporal range that we were unable to assign the site to a definite time period. The diversity of artifact types suggests procurement of native plant resources and processing activities were pursued in this location, which is likely considering the proximity of the site to Centennial Wash.

National Register Assessment

The site is in good condition despite the presence of numerous two-tracks extending into the site from the dirt road at the north end. It is possible that additional deposits of cultural materials and cultural features have been buried due to flooding of the wash and, even if such is not the case, collection and laboratory analysis of the ceramic artifacts have the potential to place this site in a temporal framework. Additional study of the entire assemblage also might further define the site's function. Archaeological testing, and possibly data recovery of Feature 1, has the potential to yield important information about the site's subsurface potential. Therefore, we recommend site AZ S:7:49 (ASM) be considered eligible for listing on the National Register National Register.

ISOLATED OCCURRENCES

Thirty-one isolated occurrences (IOs) of prehistoric artifacts were found and recorded (Table 5). Ceramics were identified at 13 of the IOs, chipped stone artifacts at 12 IOs, and a combination of chipped stone and ceramics at 3 IOs. A combination of ground stone and chipped stone was observed at just one IO. The single ground stone artifact (part of IO 6) was too small to determine tool type. IO 30 includes chipped and ground stone, ceramics, and FCR. Completed Isolated Occurrences of Cultural Materials recording forms are provided in Appendix B.

The chipped stone artifacts consist almost entirely of flakes and pieces of shatter, but one tested cobble (IO 8) and a core (IO 6) also were noted. No obvious lateral retouch or wear damage was observed on any of the flakes. Chipped stone artifacts are of locally available materials, including fine-grained basalt, siltstone, quartzite, chert, and rhyolite.

Most of the sherds located as isolates are plain wares, but numerous buff ware sherds, including a scatter that appears to the remains of a single jar (IO 10), also were found and recorded. A small number of very eroded red-on-buff sherds were found, but we were unable to determine the decoration style in most cases. IO 9 includes a single sherd with a burgundy exterior. This color likely is the result of differential firing, but we were unable to determine whether it was a type of plain ware or buff ware.

The 30 isolated occurrences found during the survey are evaluated as having no historic values that warrant preservation. It is recommended they be considered ineligible for the National Register.

TABLE 5 SUMMARY OF ISOLATED OCCURRENCES			
IO No.	**UTM Coordinates**	**Area (meters)**	**Description**
1	N3715175, E280930	< 1	1 red chert tertiary flake
2	N3715207, E280959	11 x 18	2 tertiary flakes, 1 broken flake, 1 primary flake, 3 pieces of shatter, and 1 secondary flake, all of red chert
3	N3714367, E283293	10 x 21	7 sand tempered plain ware sherds, 1 dark grey rhyolite secondary flake
4	N3714472, E283298	1 x 10	1 red siltstone multidirectional core, 2 red siltstone secondary flakes, 5 sand tempered plain ware sherds
5	N3714029, E283291	1 x 9	2 thin sand-tempered plainware sherds, 1 thick sand-tempered plainware sherd
6	N3713674, E283288	1 x 3	1 tested yellow quartzite cobble, 1 small ground stone fragment, 1 basalt secondary flake
7	N3712713, E283261	1 x 6	4 plain ware sherds, very fine tempered, but including some large pieces of quartz
8	N3712771, E283256	< 1	5 buff ware sherds
9	N3712929, E283271	5 x 20	28 thick sand-tempered plain ware body sherds, 12 buff ware sherds, 12 thin sand-tempered plain ware sherds, 1 unknown sherd with burgundy exterior
10	N3714560, E283329	8 x 9	20 buff ware sherds from a single jar
11	N3713492, E282322	1 x 3	2 brown chert tertiary flakes
12	N3713484, E282336	< 1	1 brown chert tertiary flake
13	N3713449, E282359	< 1	1 red chert secondary flake
14	N3713429, E282366	< 1	1 purple chert tertiary flake
15	N3713404, E282345	1	2 sand-tempered plain ware sherds
16	N3713359, E282327	< 1	1 sand-tempered plain ware sherd
17	N3713343, E282331	1 x 2.5	1 red chert tertiary flake, 1 sand-tempered plain ware sherd
18	N3713382, E282305	< 1	1 pinkish-brown rhyolite or siltstone tertiary flake
19	N3713409, E282292	< 1	1 pinkish-brown siltstone tertiary flake
20	N3713401, E282257	< 1	1 sand-tempered plain ware sherd
21	N3713376, E282270	< 1	1 sand-tempered plain ware sherd
22	N3713357, E282257	< 1	1 eroded red-on-buff sherd
23	N3713384, E282180	< 1	1 red chert secondary flake
24	N3713493, E282168	1 x 2	1 sand-tempered plain ware sherd, 2 buff ware sherds
25	N3713512, E282155	< 1	1 purplish rhyolite tertiary flake
26	N3713560, E282075	< 1	1 grey rhyolite primary flake
27	N3713735, E281986	< 1	2 sand-tempered plain ware sherds
28	N3713878, E281870	< 1	4 red-on-buff sherds
29	N3715274, E281631	< 1	1 red rhyolite tertiary flake
30	N3713407, E282405	30 x 50	27 plain ware sherds; 1 ground stone fragment; 1 core, 5 flakes and 2 pieces of shatter, all of purple chert; 1 basalt flake; and 1 piece of FCR

CHAPTER 4 - CONCLUSION AND RECOMMENDATIONS

This concluding chapter summarizes the results of the survey, then presents an assessment of potential impacts of the proposed project on cultural resources. The chapter ends with recommendations for further consideration of cultural resources as project planning and construction proceeds.

SUMMARY

The crew surveyed a total of 987 acres, requiring 25 person-days to complete the field survey. They recorded 30 isolated occurrences of cultural materials and 2 prehistoric archaeological sites. Sites AZ S:7:48 and 49 (ASM) are both large, low-density scatters of prehistoric artifacts associated with Hohokam use of the region. The surface artifact assemblages suggest both sites reflect use of the Harquahala Plain north of the Centennial Wash for procurement of native plant resources, and likely some processing as well. Both sites are in good condition, and have the potential to contain buried cultural features or deposits of cultural materials. We recommend both sites be considered eligible for listing on the National Register for their information potential (criterion D).

The 30 isolated occurrences include single or small clusters of ceramics and chipped stone, with one small piece of ground stone present at one of the IOs. Most of the IOs were found just north of Centennial Wash along the northern portion of the proposed pipeline corridor. These IOs do not have any historic values that warrant preservation; therefore, we recommend they collectively be considered ineligible for National Register listing.

ASSESSMENT OF POTENTIAL IMPACTS

The analysis of potential impacts addressed the issue of whether construction of the facilities associated with the proposed project would directly or indirectly affect any significant cultural resources. Although this is not a federally funded project, impacts were assessed in accordance with regulations for *Protection of Historic Properties* (36 CFR Part 800), which define an effect as a direct or indirect alteration of the characteristics of a historic property that qualify it for inclusion in the National Register. Effects are considered "adverse" when the alterations diminish the integrity of a property's location, design, setting, materials, workmanship, feeling, or association. Examples of adverse effects include the following:

- physically destroying a property
- inappropriately altering a property by not following the Secretary of the Interior's Standards for Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines
- moving a property from its historic location

- changing the physical features within the property's setting that contribute to its historical significance

- introducing visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features

- transferring, selling, or leasing a property out of federal ownership or control without adequate restrictions to ensure preservation

Ground disturbance directly associated with construction of the proposed project was identified as having the only potential to adversely affect the archaeological sites recorded in the project vicinity. The introduction of visual, atmospheric, or audible elements into the setting of such sites is not expected to affect the scientific information of archaeological sites, but these types of effects possibly could degrade the integrity of any traditional cultural places in the vicinity of the project.

Other impacts may be indirect. Ground disturbance could result from overland travel that might increase as a result of enhancing vehicular access into an area. The simple increase of human presence in previously undeveloped areas also could result in inadvertent damage or intentional vandalism to archaeological sites. However, the project is not expected to increase public accessibility.

In addition to the two sites recorded by the survey specifically conducted for the proposed project, Site AZ S:11:3 (ASM) has been previously recorded at the southern end of the proposed natural gas pipeline lateral (refer to Figure 3).

Site AZ S:11:3 (ASM) originally was identified during a survey of alternative corridors for the proposed Palo Verde-Devers transmission line (Berry 1978). It is described on site forms on file with ASM, MNA, and BLM as being located along the boundary between La Paz and Maricopa counties, approximately 100 meters northeast of the existing EPNG pipeline. One of these forms indicates the site does not possess sufficient value to justify its preservation or development. It is described on the BLM site form (filed under number NA 14,787) as a sherd scatter derived from a single vessel likely broken by a vehicle driving over it. Vehicle tracks were observed over the site. Site AZ S:11:3 (ASM) would only be considered an isolated occurrence of cultural materials by today's guidelines for determining what constitutes an archaeological site. The site is described simply as the remains of a broken Colorado Beige vessel. A single sherd had been collected at the time of discovery, but no other work apparently has been conducted since. The site is described as encompassing just 2 square meters and, as mentioned earlier, we did not relocate it. It is described as being located more than 300 feet east of the proposed gas pipeline alignment, and thus is unlikely to be directly or indirectly affected by the proposed construction.

Site AZ S:7:48 (ASM) is located approximately 90 feet east of the proposed natural gas pipeline alignment, north of Centennial Wash. Site AZ S:7:49 (ASM) is located within the proposed well field. Both are recommended as eligible for National Register listing, and both potentially will be directly impacted by the proposed construction.

RECOMMENDATIONS

The records search indicated that archaeological and historical resources are not abundant in the vicinity of the proposed La Paz Generating Facility. The field survey located two archaeological sites within the boundaries of the proposed facilities, which matches our pre-field estimate that between one and four sites might be present within the footprint of the project facilities.

The two sites recorded are deemed significant because of their potential to yield important information about aboriginal adaptations within the Harquahala Plain. The current design of the proposed facilities, the well field and the natural gas pipeline lateral, indicate that both sites could be directly impacted by construction of these facilities. If the cultural resources cannot be avoided, impacts could be mitigated by undertaking studies to recover important information prior to construction. Archaeological testing and, if warranted, additional data recovery studies could be designed and implemented to mitigate the impacts on both sites.

If additional facility needs are identified, such as more access roads, supplemental cultural resource surveys may be warranted. Findings from any additional survey would be considered as project planning proceeds.

If any human remains or funerary objects are unexpectedly discovered during project construction, they should be protected and reported immediately to the director of the ASM in accordance with Arizona Revised Statutes § 41-865.

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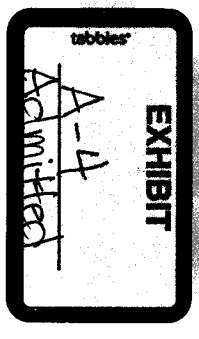
La Paz Generating Facility

Application for a Certificate of Environmental Compatibility



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Presenters

- **Kevin Geraghty**
  - Allegheny Energy
  - Overview of Allegheny and La Paz Project
- **Don Mundy**
  - Black & Veatch
  - Need for the Project
- **Randall Simpson**
  - URS Corporation
  - Environmental Studies

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La Paz Generating Facility

Application for a Certificate of Environmental Compatibility

Testimony of
Kevin C. Geraghty

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Who is Allegheny Energy Supply?

- Allegheny Energy (NYSE:AYE) is the parent company to Allegheny Energy Supply
  - Fortune 500 and Platinum 400 company
  - Annual revenues of $4 billion and assets of almost $8 billion
- Recognized as one of the top 10 most efficient operators (based on heat rate) *Electric Light & Power*
- Allegheny Energy and its successors in business for over 80 years

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Who is Allegheny Energy?

- National energy company that operates and markets:
  - Generation
  - Transmission
  - Communication
  - Distribution
  - Developing energy solutions
- Nationally present in 14 states with offices, facilities and contracts
- 14,500 MW in operation, control or advanced development
- Competitive supplier to energy markets

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Operations

- National energy services
- Operates:
  - Base load
  - Peaking
  - Mixed use power plants

    ✓ hydro, pumped storage, biomass, methane, tire derived fuel (TDF), natural gas, coal and oil facilities

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Environmental Overview

- All Allegheny facilities meet or exceed all local, state, and federal standards
- $2 billion towards environmental improvements at existing facilities
  - Sulfur dioxide emissions have been reduced by 50%
  - Nitrogen oxides emissions have been reduced by 35%
- Facilities operated in a manner that protects resources

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Community Relations

- Our philosophy is to involve and support local communities
- Company commitment of time and resources to the community
  - Schools
  - Environment
  - United Way
- Community Advisory Panels (CAPs) to maintain communications with neighbors at all Allegheny facilities
- La Paz Generating Facility CAP
  - Organized in May 2001
  - Cross section of the community
  - Improved communications throughout development and operation of the Project
  - Assisted with the development of community open house meetings

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Why Arizona

- Benefits of Arizona
  - Growing market
  - Fostering competition
  - Already familiar with market (more that 1 million MW-hours sold to Arizona utilities over the last 30 months)
- Benefits of the La Paz County site
  - Ideal site (environmental compatibility)
  - Ready availability of gas, water, and site access
  - Community support
  - Economic benefits to La Paz County
- La Paz Facility continues the Allegheny environmental stewardship philosophy
  - Plant is located far from non-attainment areas and population centers
  - Facility designed to meet and exceed environmental requirements

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Water Supply

- Acquired 2,325 acres of land with groundwater rights
- Project will use 6,500 acre-feet per year, which results in an average 40% reduction from historic agricultural use
- Central Arizona Project water was considered but not selected due to uncertain availability, price, and high quality

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Project Overview

- Located in a rural and remote part of eastern La Paz County
- Natural gas-fired, combined-cycle
- Nominal 1,080 MW capacity
  - Supplemental duct firing ensures energy is available during the most crucial times of the year

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Project Information (continued)

- "Combined cycle" technology
- Each nominal 540 MW "block" will use two gas turbines (similar to jet engines) to turn two separate generators; a third generator will use normally wasted exhaust heat from the gas turbines to produce steam
- Steam used by the steam turbine will be condensed and reused via a surface condenser and cooling towers
- The cooling towers will reuse the cooling water until the solids concentration requires its reduction; this "blowdown" will be sent to evaporative ponds to capture the solids

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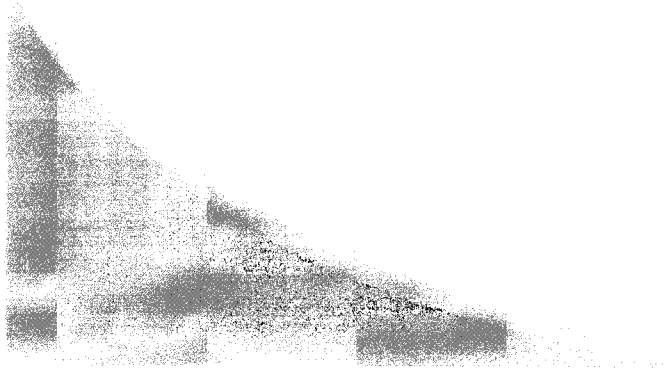
Project Information (continued)

- The best and latest water softening techniques will enable the most efficient use of "recycled" water available
- The plant will be a "zero discharge" facility; no water, other than non-impacted stormwater, will leave the property boundaries



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Project Information (continued)

- Burning gas emissions are reduced by using a Selective Catalytic Reducer (SCR) for NO_X reduction and an oxidizing catalyst for CO reduction
- Particulate matter (PM_{10}) controlled by using high efficiency drift eliminators available for the cooling towers
- Emissions controlled to 2.5 ppmvd for NO_X and 5.0 ppmvd for CO

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Commitment to the Project

- Allegheny has secured the required equipment; deliveries are scheduled for September 2003 through December 2004
  - Steam and gas turbines
  - Generators and auxiliaries
- Allegheny controls 2,325 acres of land
- Current investment of more than $200 million
- Project cost will be more than $500 million (no Arizona ratepayer risk)

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Community Benefits

- Jobs
  - Employment of approximately 35 people full time
  - Construction requiring an average of 300 people over 3 years, with a peak of nearly 700 people
  - Available positions may be filled by La Paz County residents
- Service needs
  - Significant contribution to state and local revenue
- Potential Development
  - Improvement of the immediate area's development potential by providing access to infrastructure

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Construction and Operations

- Groundbreaking (Summer/Fall 2002)
- Commercial Operation (Winter 2004-Spring 2005)
  - Staff of 35 in place by September 2003 to support plant start-up
  - Periodic maintenance that will require additional personnel on an annual basis

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Conclusions

- Optimal location for Project
- Strong community support for the Project through public contacts, the Community Advisory Panel, and open houses
- Compatible with the environment, community, and surrounding land uses; and financial benefits to the region
- Studies demonstrate that the project's minimal impact, coupled with the region's need for reliable and efficient energy, justify this Committee's recommendation for a CEC

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La Paz Generating Facility

Application for a Certificate of Environmental Compatibility

Testimony of
Donald L. Mundy

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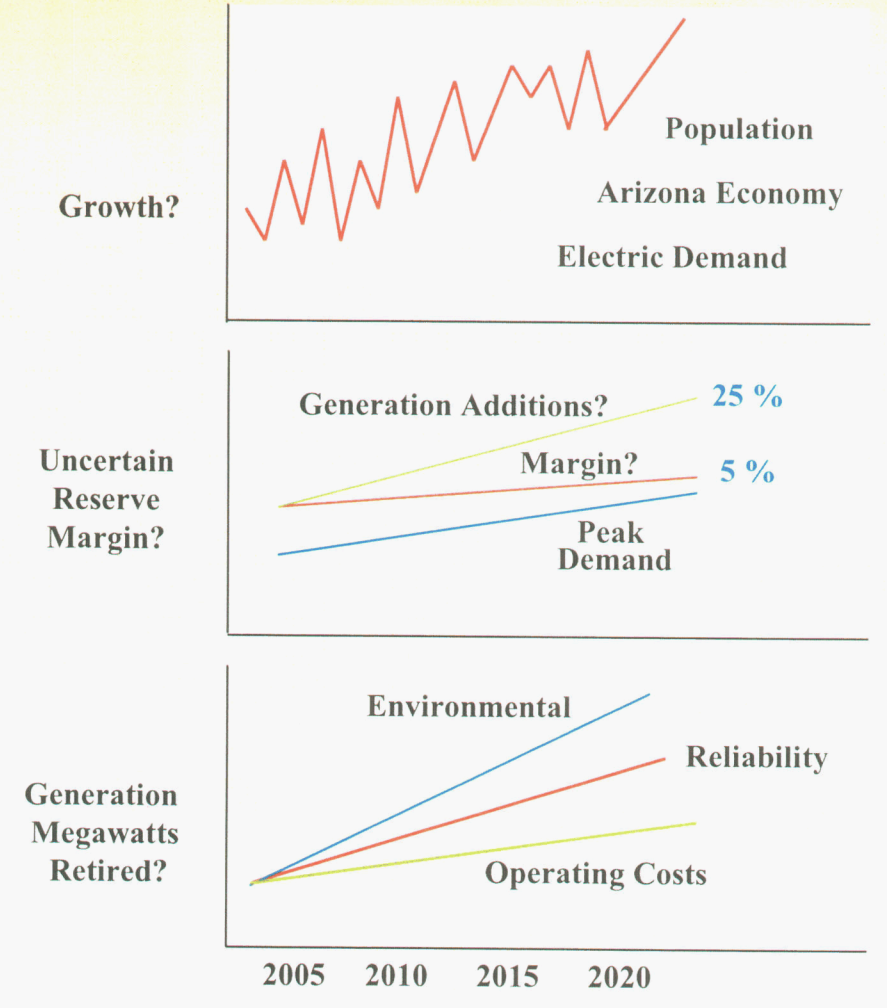
Need for New Generation in Arizona and the Region

- **Needs include:**
  - Growth
  - Retirement of old facilities
  - Environmental issues
  - Pricing stability
  - Security
  - Ancillary services



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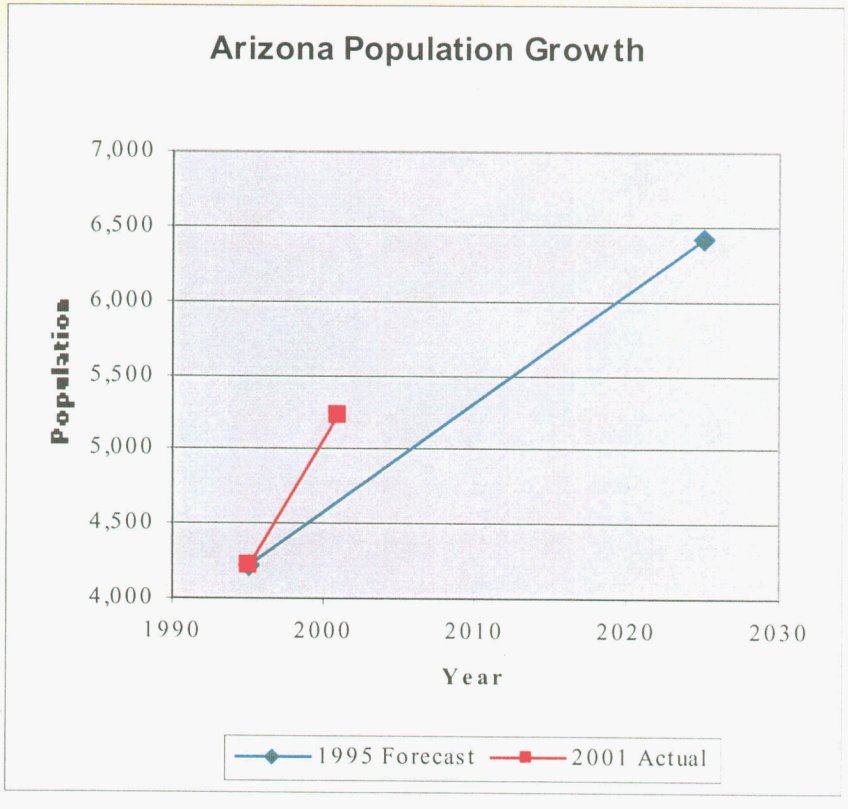
Increased Power Demand from Population Growth

- **Arizona's population growth**
  - twice the national average growth from 1995 to 2025
  - fourth fastest growing state
  - growth in 2001 projected to be 2.7% above 2000 levels



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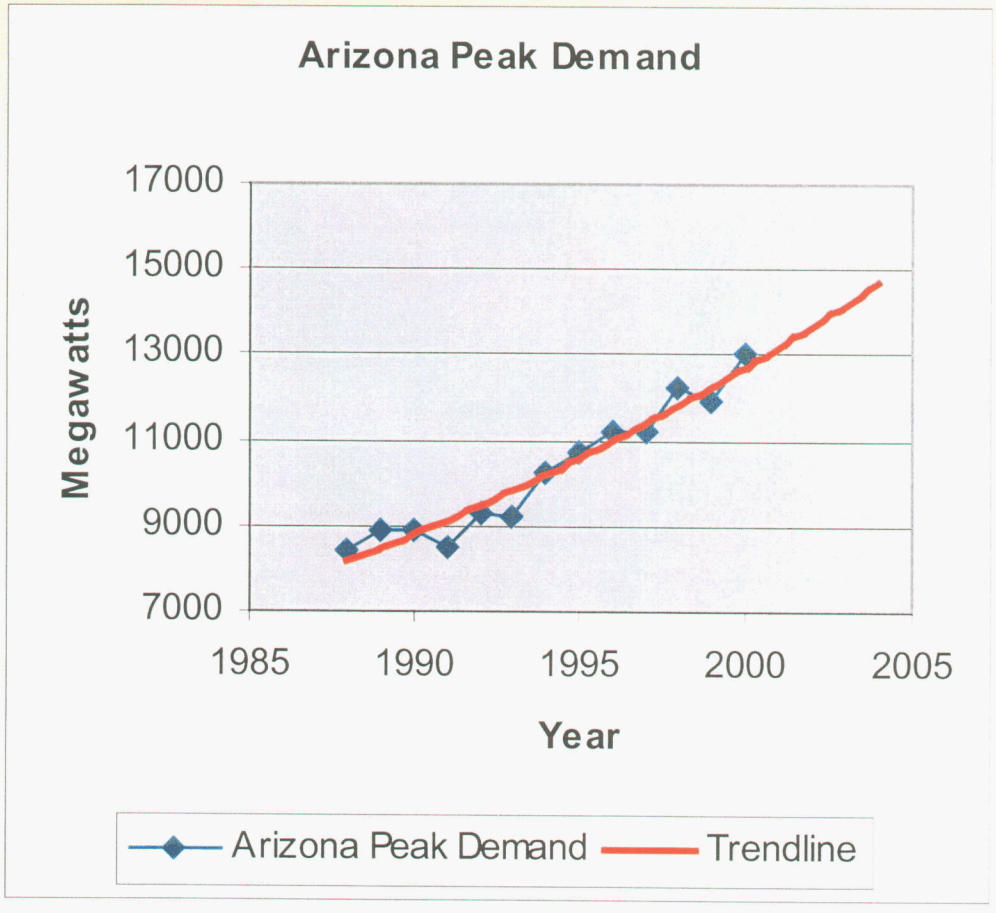
Upward Growth in Arizona Electric Demand

- **The Western Systems Coordinating Council (WSCC) predicts:**
  - 3.6% annual growth in Arizona, New Mexico, and Southern Nevada for 10 years
  - Highest growth rate of all WSCC regions
  - Growth at twice the national average



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Uncertainty about New Arizona Generation Facilities

- Announced projects would total 17,000 MW
- New projects actually online total 1,850 MW
- About 8,900 MW (60%) of remaining new projects have completed CEC process
- Phased construction allows construction to stop due to market conditions or regulatory reversal
- Past experience indicates that 50 to 60% of announced projects (7,500 to 9,000 MW) are actually completed

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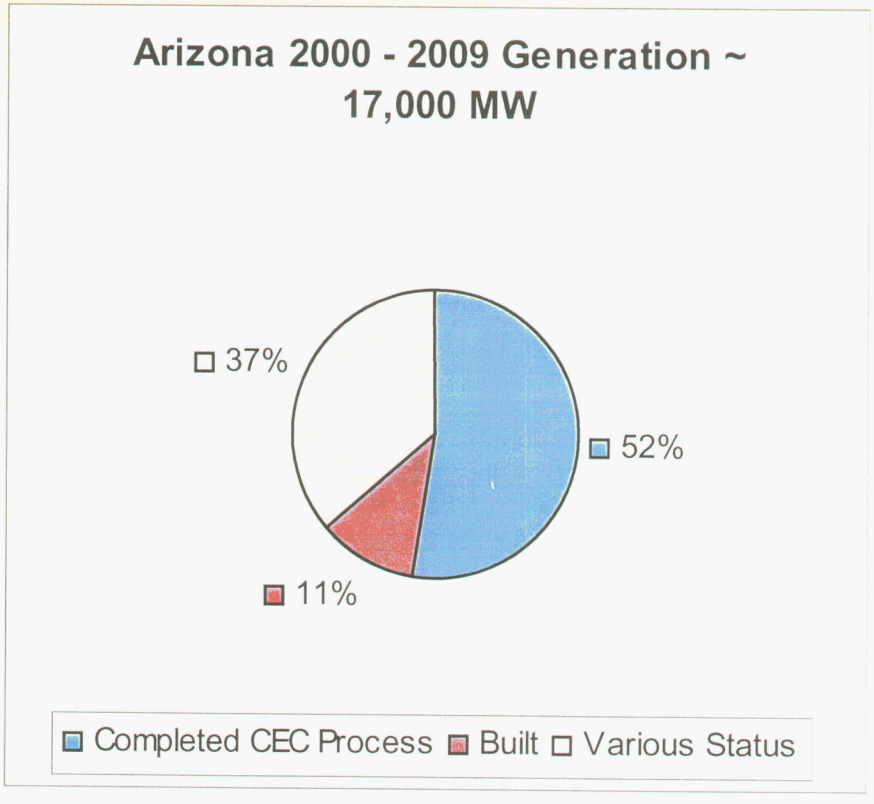
Uncertainty about New Arizona Generation Facilities

- **The WSCC 2000 to 2009 plan indicates:**
  - 10,205 MW of new Arizona generation to be built
  - 1,760 MW already built
  - Remaining 8,445 MW is 56% of 17,000 MW announced and planned
  - Low percentage indicates uncertainty or conservatism about future plants



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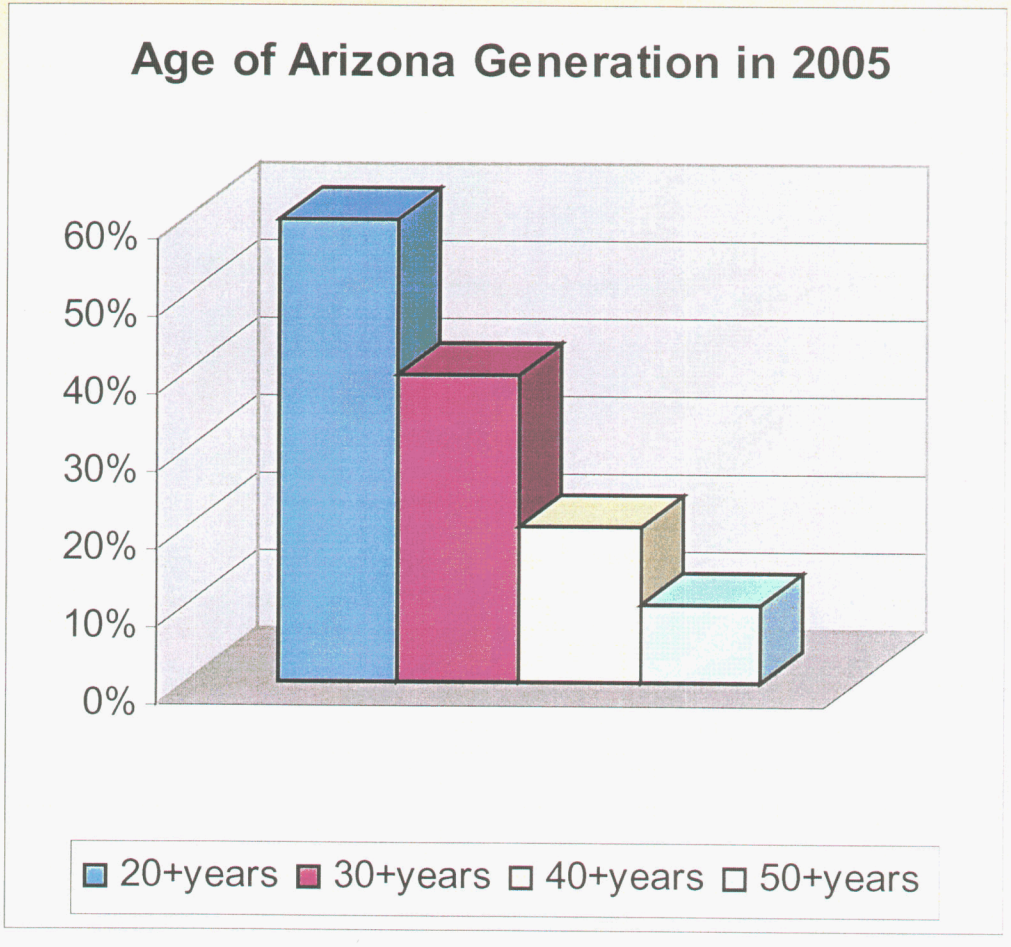
Older Arizona Generation Facilities Retiring

- **Retirement of facilities over next decade due to:**
  - Economics
  - Mechanical life
  - Fuel supply issues
  - Changing land use patterns
  - Availability and capacity of remaining facilities



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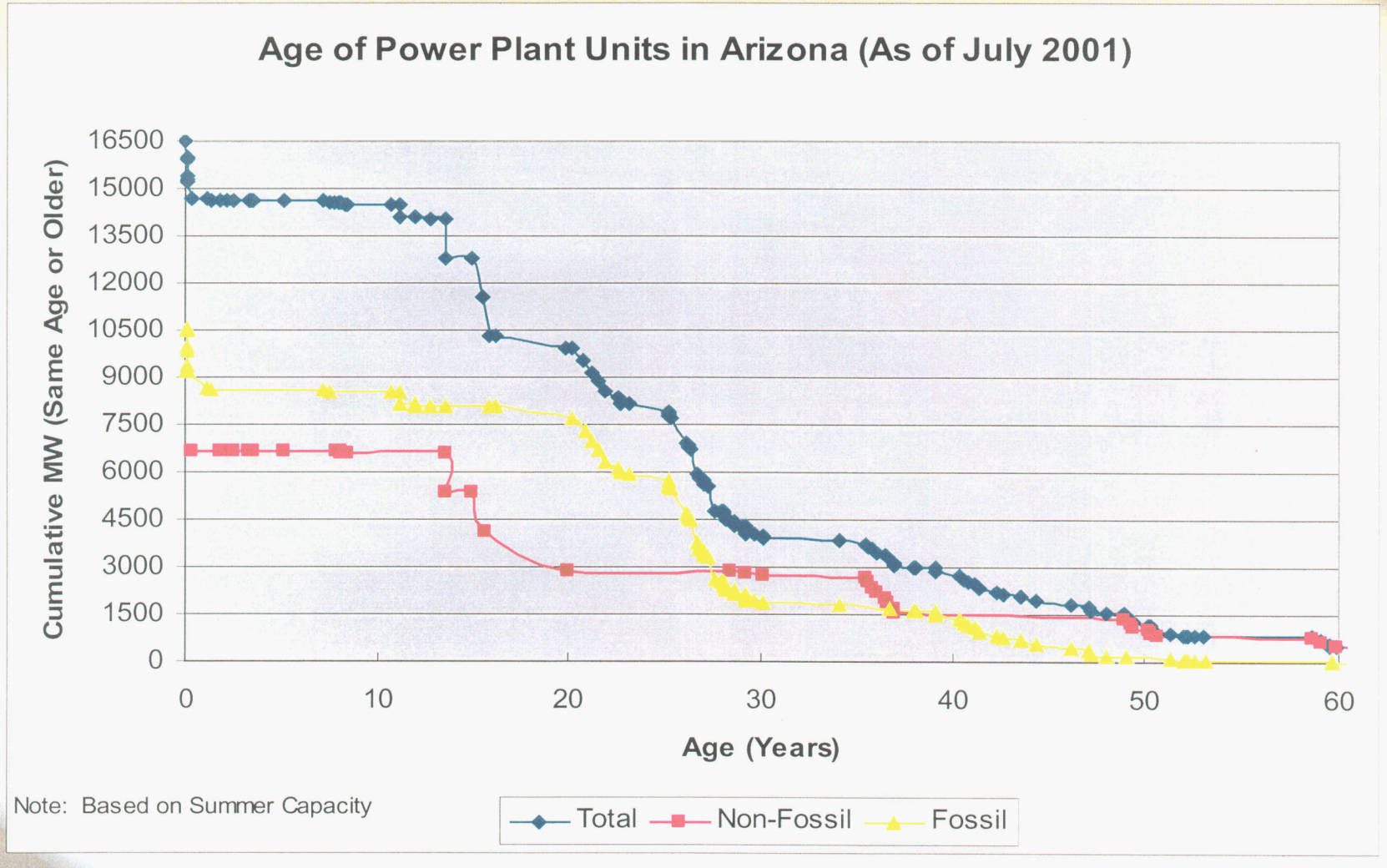
Older Arizona Generation Facilities Retiring



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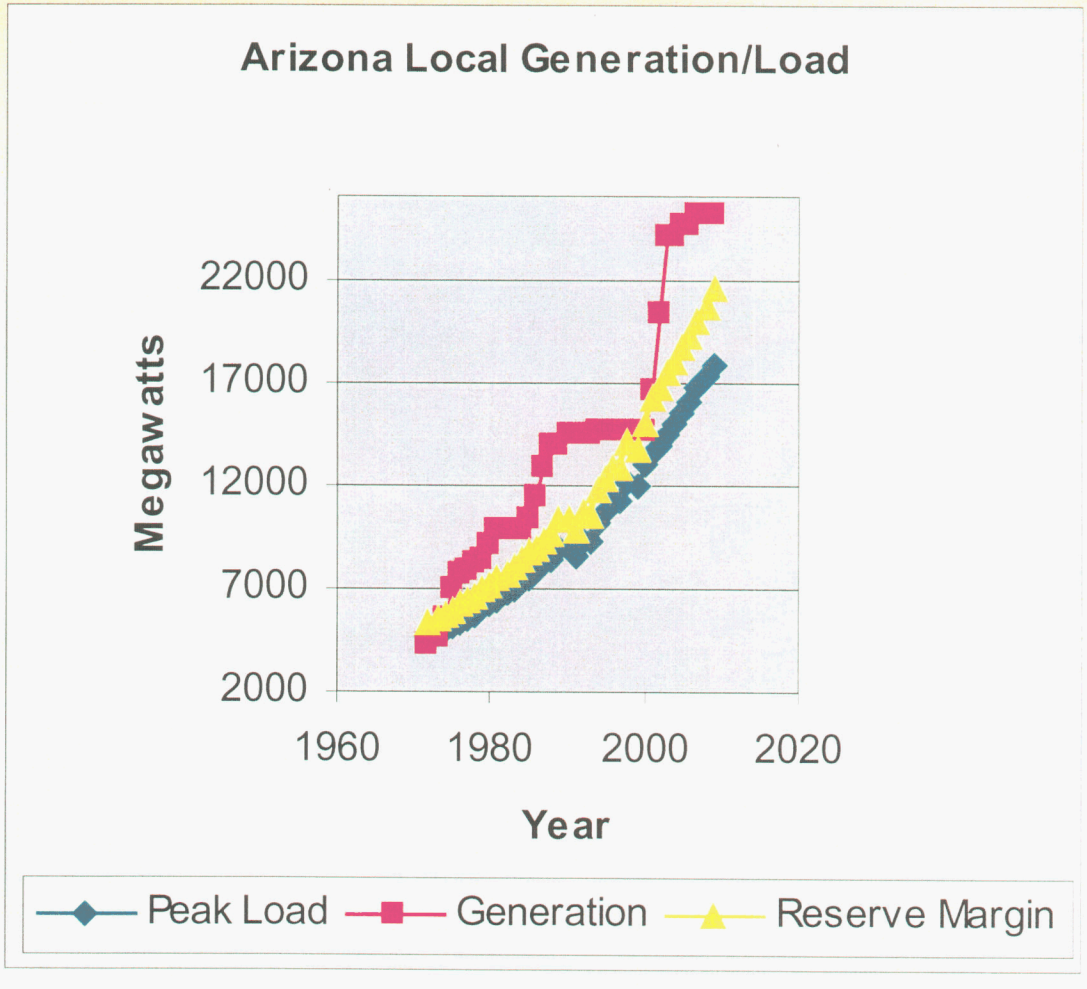
Arizona Generation to Load Margins

- **Arizona generation trends:**
  - Step function approach to maintain appropriate margins
  - Margins will diminish if some units are retired and others not built



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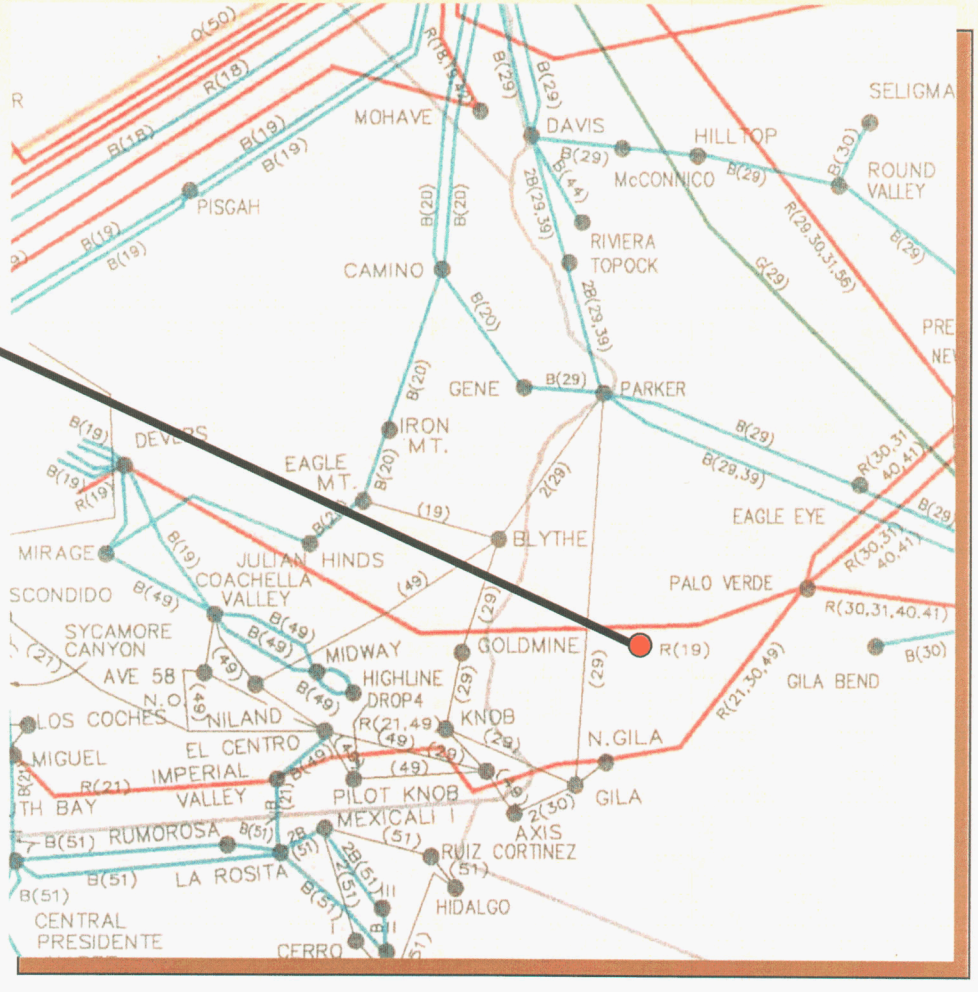
WSCC Existing System Map

La Paz Generating Facility



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La Paz Generating Facility

Application for a Certificate of Environmental Compatibility

Testimony of
Randall L. Simpson

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Environmental Studies Conducted:

- Land Use
- Biology
- Cultural/Archaeological
- Visual/Scenic
- Noise
- Air Quality
- Water

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Map of Study Area

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Land Use

- Project vicinity predominantly agricultural and non-developed desert scrub lands
- Several industrial uses in the area including 500kV transmission lines, 12kV distribution lines, pipeline corridors, Central Arizona Project canal, and Interstate 10
- Closest residence 1.75 miles north of generating facility
- One commercial and one mixed use conceptual development located 1 mile north of the generating facility (plans are 15+ years old)
- Compatible with La Paz County future plans for this area
- No adverse impacts on existing or planned land uses

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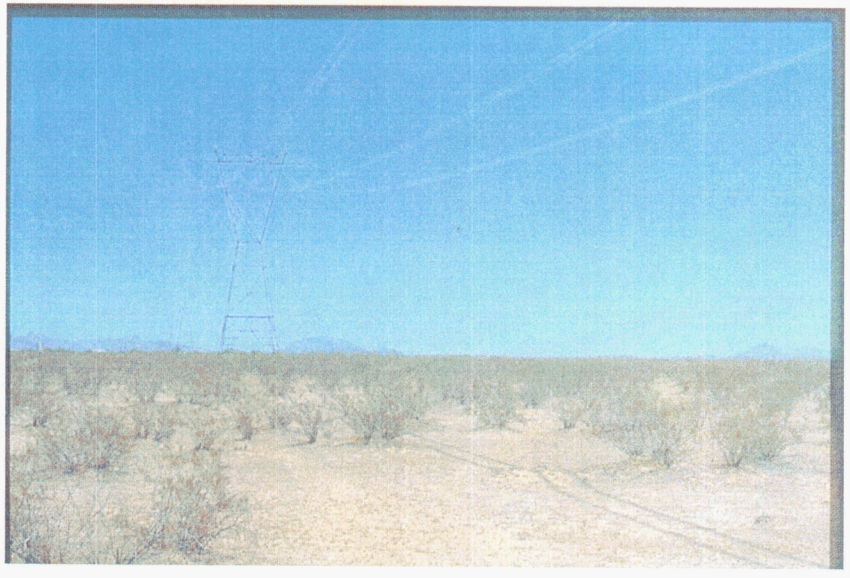
Photos of Study Area

Generating facility site from I-10



Palo Verde-Devers transmission line

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Biology

- Biological studies included literature review, agency contacts, and field surveys
- No special status or threatened and/or endangered species identified
- Disruption to common plant and wildlife species would be minimal
- No adverse impacts on biological resources

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Cultural/Archaeological

- Cultural studies included literature review, agency contacts, and field surveys
- Low density of archaeological sites identified
- Several isolated occurrences of prehistoric artifacts of low sensitivity
- Two sites consisting of a low density scatter of prehistoric artifacts of moderate sensitivity
- Sites would be avoided during construction
- No impacts on cultural/archaeological resources anticipated

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Visual/Scenic

- No designated areas of special scenic or aesthetic values identified
- Several industrial features (e.g., transmission lines, roads) and modifications are currently visible in the landscape
- Project impacts on landscape scenic quality would be moderate to low
- Project impacts on views from residences and Interstate 10 would be moderate to low
- Mitigation measures include using non-reflective or painted materials where possible, landscaping, and directive and shielding devices for lighting
- No adverse impacts on scenic quality or views in the vicinity of the Project

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Simulation from I-10

Viewing generating facility from eastbound I-10.

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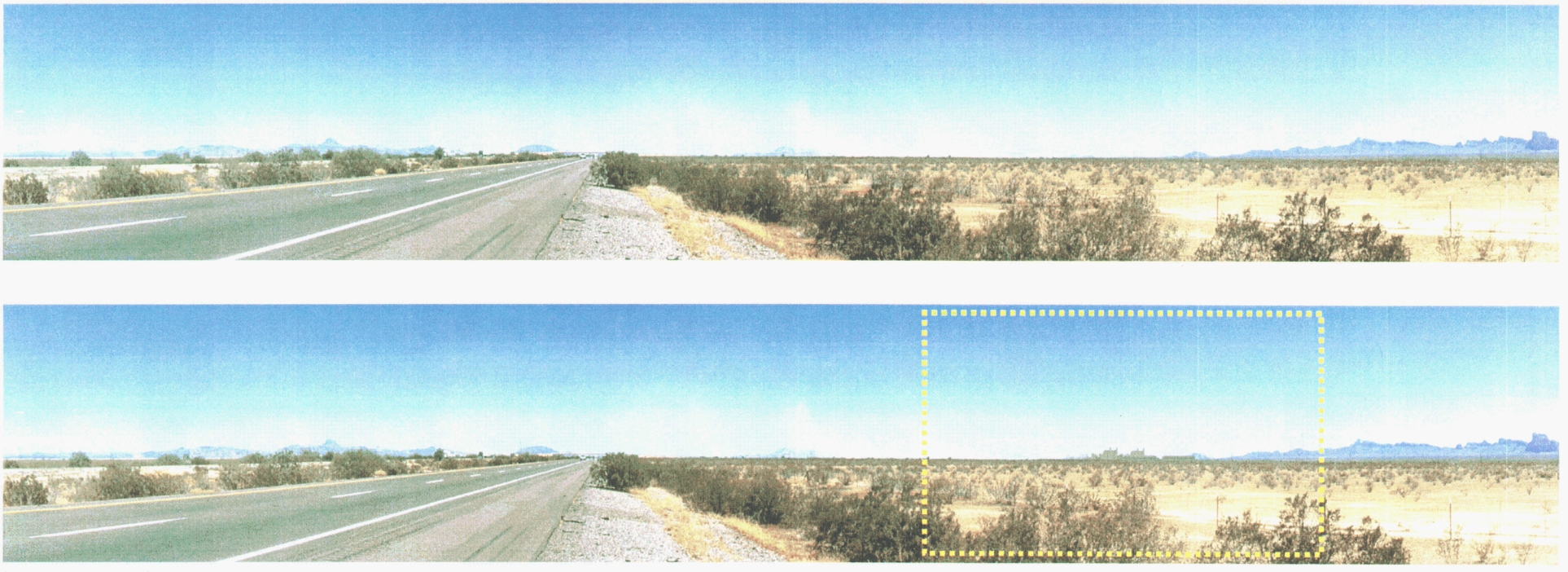
Simulation from I-10



Viewing generating facility from eastbound I-10.

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Noise and Interference

- Noise levels during construction may exceed ambient levels; however, they would be within Federal Transit Administration (FTA) and U.S. Department of Housing and Urban Development (HUD) limits
- Noise levels during normal operation would not exceed ambient levels at the nearest residence
- No interference is anticipated from construction or operation of the Project
- No adverse impacts would result due to noise or interference

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Air Quality

- Three studies were conducted including Best Available Control Technology (BACT) analysis, emissions inventory, and a visibility analysis
- Proposed BACT analysis identified the latest technology to reduce emissions to levels under the applicable standards
  - 4 to 42% of National Ambient Air Quality Standards
  - 3 to 38% of PSD increments
  - 1 to 16% of Arizona Ambient Air Quality Guidelines
- No exceedance of the screening criteria for visibility in Class I Wildernesses
- No adverse impacts will result to air quality from construction or operation of the Project

Allegheny Energy Supply
an Allegheny Energy company

Water

- Facility would use approximately 6,500 acre-feet per year of groundwater
- Three scenarios were considered when evaluating 30-year impacts on groundwater

	Scenario 1	Scenario 2	Scenario 3
Modeled Conditions	Baseline 1997 groundwater pumpage and recharge	Scenario 1 conditions in addition to 7,000 acre-feet of groundwater pumpage ("worst case")	Scenarios 1 and 2 in addition to recharge from Vidler facility up to 70,000 acre-feet per year
Groundwater Level Changes	20 to 40- foot decline in the vicinity of the Project	30 feet of additional decline in the vicinity of the Project; only 5 feet decline at nearest active well	150 to 175-foot increase in the vicinity of the Project

- Minimal impacts on water resources would result from operation of the generating facility

Allegheny Energy Supply
an Allegheny Energy company

Status of Other Permits

Permit	Filing Date	Approval Date
La Paz County zoning application	September/ October 2001	Fall of 2001
Air Permit	September/ October 2001	August 2002
Aquifer Protection Permit (APP)	October 2001	Summer of 2002
Bureau of Land Management (BLM) land exchange	June 2001	Summer of 2002
Arizona State Land Department right-of-way application	Fall of 2001	Spring of 2002

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Impact Summary Table

Resource	How is Impact Defined	Level of Impact
Land Use	Removal of sensitive land uses (e.g., residential, recreation, etc.), restrict access to property, inconsistency with land use plans or policy	Moderate to low – no adverse impacts
Biology	Removal or disturbance of special status or threatened and/or endangered plant and wildlife species	Low – no adverse impacts
Cultural/Archaeology	Removal or disturbance of historic or archaeological sites or features listed or considered eligible for listing on the State Register of Historic Places	No impacts
Scenic/Visual	Degradation of scenic quality, visual contrast of proposed facilities with existing landscape, view blockage, increase in night lighting and glare	Moderate to low – no adverse impacts
Noise	Comparison with HUD and FTA residential noise guidelines	Moderate during construction to low during operation – no adverse impacts
Air Quality	Comparison of predicted emissions with applicable standards established by the ADEQ and EPA	Moderate to low – no adverse impacts
Water	Substantial decrease or increase in groundwater levels, impacts to adjacent wells, drainages, wetlands, etc.	Moderate impacts for the "worst case" scenario and low impacts for the anticipated scenario – no adverse impacts

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Conclusions

- The location Allegheny has chosen for the Project is an excellent site, which is compatible with La Paz County's existing and future land use plans
- Environmental impacts are minimal due to strategic siting and with the application of mitigation measures
- There is an overwhelming amount of public and agency support for the Project

Allegheny Energy Supply
an Allegheny Energy company

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ALLEGHENY ENERGY SUPPLY COMPANY, LLC FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY FOR CONSTRUCTION OF A 1,080 MW (NOMINAL) GENERATING FACILITY IN SECTION 35, TOWNSHIP 3 NORTH, RANGE 11 WEST IN LA PAZ COUNTY, ARIZONA AND AN ASSOCIATED TRANSMISSION LINE AND SWITCHYARDS BETWEEN AND IN SECTION 35, TOWNSHIP 3 NORTH, RANGE 11 WEST AND SECTIONS 23-26, TOWNSHIP 3 NORTH, RANGE 11 WEST ALSO IN LA PAZ COUNTY, ARIZONA	DOCKET NO. L-00000AA-01-0116 CASE NO. 116 **NOTICE OF PUBLICATION**

RECEIVED
2001 AUG 22 P 3:51
AZ CORP COMMISSION
DOCUMENT CONTROL

GALLAGHER & KENNEDY, P.A.
2575 E. CAMELBACK ROAD
PHOENIX, ARIZONA 85016-9225
(602) 530-8000

Applicant Allegheny Energy Supply Company, LLC, by and through undersigned counsel, hereby files the attached Affidavit of Publication certifying publication of the Notice of Hearing in the Parker Pioneer on August 1 and 8, 2001. Allegheny also files the attached Proof of Publication certifying publication of the Notice of Hearing in the Palo Verde Valley Times on August 1 and 3, 2001. Finally, Allegheny files a copy of the July 20, 2001 letter to the La Paz County Board of Supervisors pursuant to Ariz. Rev. Stat. § 40-360.04.

RESPECTFULLY submitted this 22 day of August, 2001

GALLAGHER & KENNEDY, P.A.

BY: _____

Michael M. Grant
Todd C. Wiley
Gallagher & Kennedy, P.A.
2575 East Camelback Road
Phoenix, Arizona 85016-9225
Attorneys for Allegheny Energy Power Supply, LLC

EXHIBIT
tabbies
A-5
Admitted

ORIGINAL and 10 copies were filed this 22nd day of with Docket Control.

COPY of the foregoing hand-delivered this 22nd day of August, 2001 to:

Christopher Kempley, Esq.
Legal Division
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

Utilities Division
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

COPY of the foregoing mailed this 22nd day of August, 2001 to:

Laurie Woodall
Line Siting Committee Chair
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

James D. Vieregg, Esq.
Morrison & Hecker, L.L.P.
Suite 1600
2800 North Central Avenue
Phoenix, Arizona 85004-1047
Attorneys for AZURE

Kevin Geraghty
Allegheny Energy Supply Co.
Suite 201
14122 West McDowell Road
Goodyear, Arizona 85338

Linda Magnera

12921-0004/950311

GALLAGHER & KENNEDY, P.A.
2575 E. CAMELBACK ROAD
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F

GALLAGHER & KENNEDY
P.A.
ATTORNEYS AT LAW

MICHAEL M. GRANT
DIRECT DIAL: (602) 530-8291
E-MAIL: MMG@GKNET.COM

2575 EAST CAMELBACK ROAD
PHOENIX, ARIZONA 85016-9225
PHONE: (602) 530-8000
FAX: (602) 530-8500
WWW.GKNET.COM

July 20, 2001

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Gene Fisher
Chairman
LaPaz County Board of Supervisors
1108 Joshua Avenue
Parker, Arizona 85344

Re: Notice of Hearing for the Application of Allegheny Energy Supply before the Arizona Power Plant and Transmission Line Siting Committee

Dear Chairman Fisher:

Pursuant to A.R.S. § 40-360.04, enclosed is a Notice of Hearing in relation to this matter.

Very truly yours,

GALLAGHER & KENNEDY, P.A.

Michael M. Grant

By:
Michael M. Grant

Enclosure
MMG/sks
12921-0003/942738

AFFIDAVIT OF PUBLICATION

STATE OF ARIZONA
COUNTY OF LA PAZ, ss

STEVE STEVENS,
of said county, being duly sworn, deposes and says: that he is and at all times herein mentioned was a citizen of the United States, over the age of twenty-one years, and is competent to be a witness on the trial of the above entitled action, and that he is not a party to, nor interested in the above entitled matter.

That he is the Advertising Agent for the:

PARKER PIONEER
(published weekly) and which is a weekly newspaper of general circulation, published and circulated in the said County of La Paz, and is published for the dissemination of local news and intelligence of a general character, and has a bona fide subscription list of paying subscribers, and said newspaper has been established and published in the City of Parker, County of La Paz, State of Arizona, for at least one year before the publication of the first insertion of this notice and said newspaper is not devoted to the interests of, or published for the entertainment of any particular class, profession, trade, calling, race or denomination, or any number thereof.
That the:

Notice of Hearing
Docket No. L-00000AA01—116
Case No. 116

of which the annexed is a printed copy, was published in said newspaper at least 2 times, commencing on the 1st day of August, 2001, and ending on the 8th day of August, 2001, all above days inclusive, and in the regular and entire issue of said newspaper proper, and not in a supplement and said notice was published therein on the following dates, to-wit:

August 1, 2001
August 8, 2001

Subscribed and sworn to before me this 9th day of August, 2001.

Notary Public in and for the County of La Paz, State of Arizona.

OFFICIAL SEAL
SANDRA K. GRIFFIN
Notary Public - State of Arizona
MOHAVE COUNTY
My Comm. Expires July 24, 2004

My Commission Expires:

BEFORE THE ARIZONA POWER PLANT AND
TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ALLEGHENY ENERGY SUPPLY COMPANY, LLC FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY FOR CONSTRUCTION OF A 1,080 MW (NOMINAL) GENERATING FACILITY IN SECTION 35, TOWNSHIP 8 NORTH, RANGE 11 WEST IN LA PAZ COUNTY, ARIZONA AND AN ASSOCIATED TRANSMISSION LINE AND SWITCHYARDS BETWEEN AND IN SECTION 35, TOWNSHIP 8 NORTH, RANGE 11 WEST AND SECTIONS 23-26, TOWNSHIP 8 NORTH, RANGE 11 WEST ALSO IN LA PAZ COUNTY, ARIZONA.
DOCKET NO. L-00000AA01-0116
CASE NO. 116/NOTICE OF HEARING

A public hearing will be held before the Power Plant and Transmission Line Siting Committee ("Committee") at the Blue Water Resort, 11600 Resort Drive, Parker, Arizona, 85344 on Tuesday, September 4, 2001, at 10:00 a.m., (hotel contact: Darlene Hunter (520) 669-7033) or as soon as the matter can be heard, regarding the Application of Allegheny Energy Supply Company, LLC, for a Certificate of Environmental Compatibility for construction of a 1,080 mw (nominal) generating facility in Section 35, Township 8 North, Range 11 West in La Paz County, Arizona and an associated transmission line and switchyards between and in Section 35, Township 8 North, Range 11 West, and Sections 23-26, Township 8 North, Range 11 west also in La Paz County, Arizona. A map generally showing the proposed route for the proposed Project is provided below.

The Application, including detailed maps of the proposed Project, is on file with Docket Control Center of the Arizona Corporation Commission, 1200 West Washington, Suite #108, Phoenix, Arizona 85007, and the Commission's Tucson Office at 400 West Congress, Suite #218, Tucson, Arizona 85701.

Depending upon the issues raised and the number of intervenors appearing during the hearing, the Committee may deem it appropriate at some point to recess the hearing to a time and place to be announced during the hearing. At the discretion of the Committee, such resumed hearing may be held at a date, time and place designated by the Committee or its Chairman.

NOTE: Notice of such resumed hearing will be given. Published notice of such resumed hearing is not required.

Each county, municipal government and state agency interested in the proposed facilities and desiring to become a party to the certificate proceeding shall, not less then ten (10) days before the date set for hearing, file with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington, Phoenix, Arizona 85007, a notice of its intent to be party.

Any domestice non-profit corporation or association formd in whole or in part to promote conservation of natural beauty, to protect the environment, personal health or other biological values, to preserve historical sites, to promote consumer interests, to represent commercial and industrial groups, or to promote the orderly development of the area in which the facilities are to be located and desiring to become party to the certification proceeding shall, not less than ten (10) days before thedate set for hearing, file with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington, Phoenix, Arizona 85007, a notice of its intent to be a party.

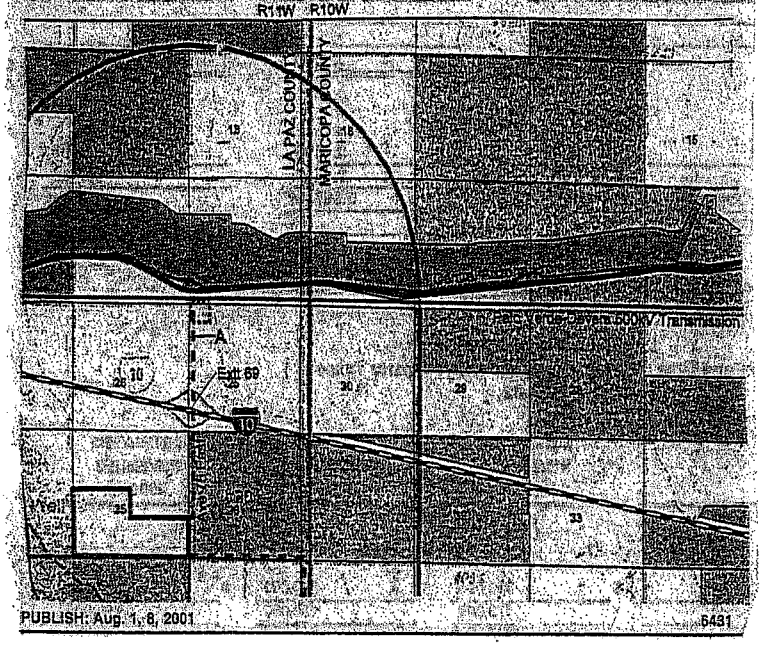
The Committee or hearing officer, at any time deemed appropriate, may make other persons parties to the proceedings.

Any person may make a limited appearance at the hearing by filing a statement in writing with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington, Phoenix, Arizona 85007, not less than five (5) days before the date set for hearing. A person making a limited appearance shall not be a party or have the right to present testimony or cross-examine witnesses.

This proceeding is governed by A.R.S. § 40-360.13 and Arizona Adminstrative Code Rules R14-3-201 to R14-3-219. The written decision of the Committee shall be submitted to the Arizona Corporation Commission pursuant to Arizona Revised Statutes Section 40-360.07. Any person intending to be a party before the Arizona Corporation Commission must be a party to the certification proceedings.

ORDERED this 18th day of July, 2001.

/s/ Laurie A. Woodall, Chairman
Arizona Power Plant and Transmission Line Siting Committee



PUBLISH: Aug. 1, 8, 2001

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA,

COUNTY OF RIVERSIDE

I am a citizen of the United States and a resident of the County Aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the

Palo Verde Valley Times

a newspaper of general circulation, printed

and published **BI-WEEKLY**

in the **CITY OF BLYTHE**

COUNTY OF RIVERSIDE, and which newspaper has been adjudged a newspaper of general circulation by the Superior

Court of the COUNTY OF RIVERSIDE,

State of California, under the date of JUNE 20, 1952, CASE NUMBER 54744; that the notice, of which the annexed has a printed copy (set in type not smaller than nonpareil) has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

PUB. Aug. 1 &3, 2001

I certify (or declare) under penalty of perjury that the forgoing is true and correct.

DATED AT BLYTHE,

California 14 day of August 2001.

Signature

Palo Verde Valley
Times
231 N. SPRING ST., P. O. BOX 1159
BLYTHE, CALIFORNIA 92225

This space is for the County Clerk's Filing Stamp

PROOF OF PUBLICATION

Gallagher & Kennedy

Allegheny Legal Publication

BEFORE ARIZONA POWER PLANT AND
TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ALLEGHENY ENERGY SUPPLY COMPANY, LLC FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY FOR CONSTRUCTION OF A 1,080 MW (NOMINAL) GENERATING FACILITY IN SECTION 35, TOWNSHIP 3 NORTH, RANGE 11 WEST IN LA PAZ COUNTY, ARIZONA AND AN ASSOCIATED TRASMISSION LINE AND SWITCHYARDS BETWEEN AND IN SECTION 35, TOWNSHIP 3 NORTH, RANGE II WEST ALSO IN LA PAZ COUNTY, ARIZONA.

DOCKET NO. L-00000AA01-0116

NOTICE OF HEARING

CASE NO. 116

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The Application, including detailed maps of the proposed project is on file with Docket Control Center of the Arizona Corporation Commission, 1200 west Washington, Suite #108, Phoenix, Arizona 85007, and the Commission's Tucson Office at 400 West Congress, Suite #218, Tucson, Arizona 85701.

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NOTE: Notice of such resumed hearing will be given. Published notice of such resumed hearing is not required.

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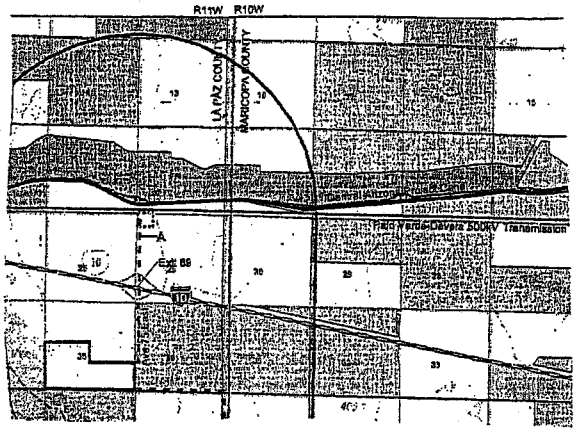
The Committee or hearing officer, at any time deemed appropriate, may make other persons parties to the proceedings.

Any person may make a limited appearance at the hearing by filing a statement in writing with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington, Phoenix, Arizona 85007, not less than five (5) days before the date set for hearing. A person making a limited appearance shall not be a party or have the right to present testimony or cross-examine witnesses.

This proceeding is governed by A.R.S. § 40-360 to §40-360.13 and Arizona Administrative Code Rules R14-3-201 to R14-3-219. The written decision of the Committee shall be submitted to the Arizona Corporation Commission pursuant to Arizona Revised Status Section 40-360.07. Any person intending to be a party before the Arizona Corporation Commission must be a party to the certification proceedings.

ORDERED this 18th day of July, 2001.

Laurie A. Woodall, Chairman



Pub. Aug. 1 & 3, 2001

URS

July 2, 2001

Arizona Corporation Commission
Docket Control
1200 West Washington
Phoenix, Arizona 85007

Re: Siting Committee Application of Allegheny Energy Supply Company, LLC for a Certificate of Environmental Compatibility

Dear Sir/Madam:

Enclosed and filed this date are 26 copies of the Application of Allegheny Energy Supply Company, LLC for a Certificate of Environmental Compatibility. Also enclosed is a check in the amount of $10,000 for the filing fee.

Legal notices or other communications concerning the Application should be directed to:

Michael M. Grant, Esq.
Todd C. Wiley, Esq.
Gallagher & Kennedy, P.A.
2575 East Camelback Road
Phoenix, Arizona 85016-9225

Very truly yours,

URS

Randall L. Simpson

cc: Laurie Woodall (w/encl., via hand delivery)
Office of the Attorney General
1275 West Washington
Phoenix, Arizona 85007

VIA HAND DELIVERY

EXHIBIT A-6 Admitted

URS Corporation
7720 North 16th Street, Suite 100
Phoenix, AZ 85020
Tel: 602.371.1100
Fax: 602.371.1615

BEFORE THE ARIZONA POWER PLANT AND

TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF ALLEGHENY ENERGY SUPPLY CO. LLC FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY FOR CONSTRUCTION OF A 1,080 MW (NOMINAL) GENERATING FACILITY IN SECTION 35, TOWNSHIP 3 NORTH, RANGE 11 WEST IN LA PAZ COUNTY, ARIZONA AND AN ASSOCIATED TRANSMISSION LINE AND SWITCHYARDS BETWEEN AND IN SECTION 35, TOWNSHIP 3 NORTH, RANGE 11 WEST AND SECTIONS 23-26, TOWNSHIP 3 NORTH, RANGE 11 WEST ALSO IN LA PAZ COUNTY, ARIZONA	DOCKET NO. _____ CASE NO. _____

APPLICATION

BY

ALLEGHENY ENERGY SUPPLY COMPANY, LLC

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INTRODUCTION

INTRODUCTION

PROJECT DESCRIPTION

Allegheny Energy Supply Company, LLC (Allegheny) requests a Certificate of Environmental Compatibility (CEC) from the Arizona Power Plant and Transmission Line Siting Committee (Committee) for construction of the La Paz Generating Facility in La Paz County, Arizona (the project). Allegheny will construct, own, and operate a 1,080-megawatt (MW) (nominal) facility approximately 21 miles southeast of Salome and Wenden in eastern La Paz County. The project includes two natural gas-fired, combined-cycle power blocks nominally rated at 540 MW each. In addition, the project includes a short 500kV transmission line and would be connected to the nearby El Paso Natural Gas (EPNG) pipeline via a pipeline lateral. A well field also will be locatd less than 0.25 mile southeast of the generating facility. An aerial photograph of the proposed project including the generating facility site and transmission line interconnect is shown on Figure 1.

This application contains the necessary environmental studies to support Allegheny's determination that the project results in no adverse environmental impacts on the surrounding area and is compatible with current and future land uses. Additionally, it contains documentation regarding the economic benefits of the proposed project to La Paz County and community involvement Allegheny has conducted to date.

PURPOSE AND NEED

Allegheny's proposed generating facility would help serve current and future energy needs in Arizona, including La Paz County, and would improve Arizona's and the western grid's reliability.

Arizona's rising energy needs have been well documented in recent studies by the Western Systems Coordinating Council (WSCC) and information supplied to the Arizona Corporation Commission (Commission). It is anticipated that Arizona alone may need 500 to 600 MW of new generation per year through 2009. The Arizona, New Mexico, Southern Nevada region of the WSCC need estimates are for approximately 1,000 MW per year through 2009.

As with other marketable commodities, the key to reliable and low-cost electricity is ample supply and a market that fosters many competitive suppliers. Electricity is like any other commodity that is traded. When supply is lower, prices are higher, and when supply is ample, competitive pricing is required for a seller to move the commodity.

Unlike most commodities, electricity cannot be stored or warehoused easily; therefore, unexpected changes in availability tend to drastically affect the price. Locating sufficient generating capacity within Arizona's borders assures the state's users that they will have a competitive advantage when it comes to the cost of electricity.

Strengthening system reliability is another benefit of the project. The generating facility would reinforce the reliability and improve the transport capability of the existing Palo Verde-Devers 500kV transmission line by providing the only voltage support between the Palo Verde Nuclear Generating Facility and Palm Springs, California. The new 500kV switchyard in La Paz County also would provide improved interconnection of Arizona's 500kV transmission grid.

The new switchyard also would allow for improved electrical service for eastern La Paz County. The switchyard construction would greatly reduce the cost of introducing local lower voltage transmission (230kV, 115kV, and 69kV) and distribution lines (12kV) to the area. Ratepayers and developers would save substantial costs because Allegheny bears the construction costs of the 500kV switchyard.

Other purposes, needs, and benefits of the facility include potential replacement power for existing plant retirements, displacement of less efficient power from older plants, and displacement of less environmentally friendly units. The facility will also increase overall electric system security and provide additional local and regional ancillary services.

OVERVIEW OF SITE SELECTION PROCESS

Allegheny spent more than 12 months and a half million dollars to investigate several potential areas in La Paz and Maricopa counties prior to selecting the proposed site for the project. The screening process involved analysis of environmental data, engineering requirements, economics, and community input, as described below.

Environmental Data —Evaluating environmental conditions included reviewing available maps, technical reports, and agency regulations with respect to air quality, land use/zoning, biology, cultural resources, aesthetics, groundwater supply/quality, and noise. After thoroughly reviewing these issues, Allegheny is confident that the project will not result in significant impacts on resources in the area.

Engineering Requirements—There are three primary considerations when determining the engineering feasibility of a generating facility site including proximity to a natural gas pipeline, proximity to an available transmission line interconnection, and availability of water. The natural gas pipeline and transmission line must have adequate capacity to support the generating facility. Other considerations include availability of land, availability of railroad and roads for delivery of equipment, and site access.

Economics —Several factors are considered in determining economic feasibility of a generating facility including costs to deliver energy to customers, transmission and gas connection costs, water costs, and site development costs.

Community Input—Support and input from the community is one of the most important considerations when developing a generating facility. Several issues are considered with emphasis on being a good neighbor including traffic, acoustics, aesthetics, health, and economic benefits like jobs and tax benefits for the community.

The site proposed for the La Paz Generating Facility offers an excellent blend and balance of the elements described above. Operation of the facility would result in no adverse environmental impacts, while nearly doubling the tax base for La Paz County. A more detailed economic study is attached to the Application as Exhibit J-1.

The predominant land uses in the area include agriculture, utilities (500kV transmission line and natural gas pipeline corridors, natural gas compressor station, water recharge facility, and Central Arizona Project [CAP] canal corridors), Interstate 10, non-developed open space, and dispersed residences. The generating facility site is located on land previously used for agriculture. La Paz County is in the process of rezoning the land to Heavy Industrial (HI), and a special use permit for construction and operation of the project is pending. Allegheny has obtained right-of-way (ROW) for an access road leading from Interstate 10 to the generating facility site along Avenue 75E.

The project's close proximity to an existing transmission line (approximately 1.75 miles) and natural gas pipeline corridor (approximately 5.5 miles) greatly reduces potential environmental impacts in the area. The proposed pipeline lateral and transmission line interconnect would cross agriculture and non-developed desert scrub landscapes.

The proposed generating facility site is more than 50 kilometers (30 miles) from the nearest western boundary of the Maricopa County non-attainment zones (PM_{10}, Ozone and CO) and more than 150 kilometers (96 miles) from the closest Class I wilderness (Pine Mountain). The facility is located approximately 6 to 7 miles from the Class II Eagletail Mountains Wilderness. Despite the fact that the facility is located outside a non-attainment area, it nonetheless will be equipped with Best Available Control Technology equipment ensuring emissions below Arizona Department of Environmental Quality and U.S. Environmental Protection Agency clean air standards. Therefore, the facility would have minimal impacts on air quality.

Studies conducted as part of this site investigation, along with studies conducted for the construction of the nearby water recharge facility, show that the generating facility would have minimal impact on the aquifer over the life of the project. Water supplies for the plant are immediately available from the underlying aquifer, which is within the Harquahala Basin and Irrigation Non-Expansion Area (INA). Allegheny has acquired 2,325 acres of lands in the vicinity of the project within the Harquahala Basin that are eligible for irrigation under the requirements of the INA (A.R.S. § 49-437[B]). Allegheny intends to manage these lands so that they are not irrigated with groundwater during the period of the project. The lands may be irrigated with CAP water to maintain their existing agricultural uses. Allegheny's use of groundwater for the project would be in compliance with A.R.S. § 49-440(A), which provides for withdrawals of groundwater for commercial or industrial uses in an amount of 6 acre-feet in any year or a maximum of 30 acre-feet for any period of 10 consecutive years. The existing agricultural lands are currently in use for production of crops (using CAP water) and/or grazing. Allegheny will be able to use the groundwater rights associated with these lands (reducing potential use by almost half), while not impacting the current land use. Allegheny intends to allow the local agricultural interests of Harquahala Valley to be served by contracting with a land manager to assure that these farmlands are available for lease and continue to provide a living for tenant farmers and jobs for Harquahala Valley residents.

La Paz County and the communities of Salome and Wenden strongly support this facility. Details of the economic benefits are discussed in Exhibit J-1, a report on the economic and fiscal impact of the facility prepared by the Center for Business Research at Arizona State University (ASU). The project provides many needed well-paying jobs. Its construction would require an average of 300 men and women during a two-and-a-half-year time period. The construction jobs provide access to new skills training, potentially leading to stable employment for years to come because of the long-term maintenance needs of this project and similar projects that will operate within a 100 mile radius of the communities. The project would require 25 to 30 full-time operations staff from the immediate area at attractive salaries. Tax revenues associated with the construction of the facility are anticipated to be dramatic. The impact would be felt by every citizen in La Paz County through improved services and reduction in individual tax obligations. To summarize the ASU report, plant construction annualized direct and indirect spending will total $86 million serving to create 860 in-state jobs and Arizona household earnings of $31 million. Construction period direct and indirect tax revenues will total $5.5 million. Plant operations will produce an annual payroll of $3 million and an additional 760 jobs and $28 million in indirect earnings, purchases, and spending. Operational tax revenues will be $17.5 annually over the life of the project. Additionally, local development opportunities should improve with addition of the facility. Costs for new local residential and commercial developments would be greatly reduced with the addition of an access road, gas, communications, and the new 500kV switchyard/substation, which can step down the power to provide local electrical service.

Beyond the potential benefits that the facility would have on the economics of the area, Allegheny has fostered relationships with the nearby communities through a community involvement program described in Exhibit J-3. Allegheny has received essential feedback from an open and supportive community, and the community gains a new neighbor that has a proven track record of improving the communities it serves (Exhibit J-2 contains Letters of Support). Allegheny has developed a Community Advisory Panel

for the facility—an excellent vehicle for Allegheny to assure that its operations meet the expectations of its neighbors now and into the future. The Panel is professionally facilitated, and like every other Allegheny generating facility, will exist throughout the life of the project.

ABOUT ALLEGHENY ENERGY SUPPLY COMPANY

Allegheny Energy Supply Company (referred to in this document as "Allegheny") is a wholly-owned subsidiary of Allegheny Energy, which deals exclusively in energy and telecommunications. Allegheny Energy and its affiliates have extensive expertise in operations, gas and electric marketing and delivery, asset management, fuel management, and energy project development. Allegheny Energy has annual revenues of more than $4 billion with holdings of almost $8 billion in assets. Allegheny Energy has been named to the Fortune 500 list, the Standard and Poor's 500 Index, and the Forbes "Platinum 400" list.

Allegheny Energy is also the holding company for Allegheny Power, one of the country's leading regulated energy service providers. Allegheny Power, ranked among the top-rated electric utilities in the nation in the American Customer Satisfaction Index (ACSI), an independent study of residential customers produced by the National Quality Research Center at the University of Michigan's Business School, provides electric and gas service in 5 states in the Mid-Atlantic region. Allegheny Power is recognized annually as one of the lowest cost providers in the East. In its inaugural appearance in the ACSI study, which ranked the 30 largest investor-owned gas and electric companies in the nation on various attributes of customer satisfaction, Allegheny Power tied for second place, just one point out of first place. A third subsidiary is Allegheny Energy Ventures, providing telecommunications and energy solutions, including distributed generation (solar, fuel cells, wind and microturbines) to customers nationwide.

Allegheny has been developing and operating generating facilities for more than 85 years. It owns, operates, controls, or has in advanced stages of development more than 12,000 MW including coal, hydro, pumped storage, natural gas, tire-derived fuel (TDF), biomass, methane and oil in 11 states across the nation. Allegheny offers Arizona a respected, established, and fast-growing energy company recognized regionally and nationally for its outstanding environmental record, operations, and expertise in providing reliable, environmentally effective, low-cost power. Allegheny's commitment to the environment is outstanding, having invested more than $2 billion in environmental projects since 1980, including the Harrison Sulfur Dioxide (SO_2) removal project, which produced arguably the best and most efficient process of its kind in the nation. This investment resulted in reductions of SO_2 by more than 50 percent and nitrogen oxides (NO_X) by more than 35 percent. Current environmental projects include installing selective catalytic reduction (SCR) units at the 1,950-MW Harrison Power Facility in Shinnston, WV and the 1,340-MW Pleasants Power Facility in Willow Island, West Virginia.

Employees participate in community environmental causes and Allegheny's Earth Day Tire Clean Up project, which has removed more than 60,000 discarded tires from the community landscape in the past two years alone. Allegheny Energy offers community matching grants for beneficial environmental projects and, along with its employees, contributes time and money to community needs projects annually. Recently, Allegheny donated $10,000 to assist with flood relief for the communities of Wenden and Salome.

Allegheny's operational expertise has resulted in a solid record of providing reliable, efficient, and low cost generation for its diversified portfolio of more than 12,000 MW. Allegheny's diversity of fuel sources (gas, oil, coal, tire-derived fuel and biomass), type of generating facility (fossil, hydro, pumped storage), and service (base load, peak, mixed use) has led to the maturity of an experienced and knowledgeable staff of operations and development personnel. Allegheny has long been recognized for its

low-cost service, which stems from its corporate culture of fiscal responsibility. Electric Light and Power magazine consistently recognizes Allegheny Energy as one of the nation's top 10 operators.

Allegheny's philosophy of community involvement focuses on providing financial and personnel resources to the community, and involving neighbors in facility operations via joint meetings where issues and concerns are raised. Allegheny continually provides assistance to fire departments, schools, emergency responders and various other community service groups; sponsors workshops for teachers; and matches employee contributions to charitable organizations.

Allegheny has Community Advisory Panels, facilitated by a professional third party communications firm at all of its generating facilities – including those facilities under construction or in advanced development (like the proposed La Paz Generating Facility). The panels provide a forum where our neighbors provide input on what effects facilities are having or will have on the community, and on solutions to minimize impacts. The meetings also serve to determine how Allegheny can better focus its involvement with and contributions to the community.

Allegheny is excited to be in Arizona. It believes that the citizens and communities of Salome, Wenden, La Paz County, and Arizona will benefit from a neighbor that has been successfully operating generating facilities for many years.

CEC REQUEST

Allegheny requests that the Committee and Commission issue a CEC for the construction of the facility and the associated 500kV transmission line and switchyards.

OVERSIZED MAP

-Figure 1- Proposed Generating Facility Location with Transmission Line and Pipeline Routes La Paz Generating Facility

TO REVIEW SEE DOCKET SUPERVISOR

DOCKET L-00000AA-01-0116-0000

APPLICATION

1. *Name and Address of the Applicant.*

Allegheny Energy Supply Company, LLC
14122 West McDowell Road, Suite #201
Goodyear, AZ 85338

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

Applicant:	Kevin C. Geraghty Allegheny Energy Supply Company, LLC 14122 West McDowell Road, Suite #201 Goodyear, AZ 85338 623-536-6310
Attorneys:	Michael M. Grant Todd C. Wiley Gallagher & Kennedy 2575 E. Camelback Road Phoenix, AZ 85016-9225 (602) 530-8000
Environmental Consultant:	Randall L. Simpson URS Corporation 7720 N. 16th Street, Suite 100 Phoenix, AZ 85020 (602) 371-1100

3. ***State each date on which the applicant has filed a ten-year plan in compliance with A.R.S. 40-360.02 and designate each such filing in which facilities for which this application is made were described. If they have not been previously described in a ten-year plan, state reasons therefore.***

A.R.S. 40-360.02 does not require a ten-year plan for the proposed generating facility. The first ten-year plan for the proposed 500kV transmission line interconnect which also generally described the facility was filed in September 2000. A new ten-year plan was filed on January 31, 2001.

4. ***Description of the proposed facility, including:***

4.a. With respect to an electric generating plant:

4.a.i. Type of generating facilities (nuclear, hydro, fossil-fueled, etc.)

The proposed facility is a 1,080-MW (nominal) natural gas-fired, combined-cycle electric generating plant. The proposed generating facility would consist of two power blocks, each consisting of two combustion turbines (CTs), two heat recovery steam generators (HRSGs), steam turbine, condenser, transformers, and associated auxiliaries. Additionally, the facility would include cooling towers, a building for administration, maintenance, and warehousing, a plant switchyard, and other common facilities (i.e., tanks, sedimentation ponds, auxiliary boilers, emergency generator, and emergency fire pump). The facility also would include a 500kV switchyard to interconnect with the Palo Verde-Devers 500kV transmission line, located on the

Palo Verde-Devers line at the point of interconnection, approximately 1.75 miles from the proposed generating facility site.

The CTs feature advanced dry, low-NO_X combustors and use evaporative inlet cooling. The rejected heat from each CT is passed through the HRSG to generate steam for the steam turbine. A supplemental duct-firing system (SDF) would be installed in each HRSG to allow the facility to reach desired capacity during critical peak days. The SDF consists of the necessary piping and burners necessary to deliver natural gas downstream of the CT exhaust flange at the inlet plenum of the HRSG.

The HRSGs would be fitted with Best Available Control Technology (BACT) equipment, ensuring emissions below standards required by the Arizona Department of Environmental Quality (ADEQ) and the U.S. Environmental Protection Agency (EPA). NO_X would not exceed 2.5 parts per million volumetric dry volume (ppmvd) and carbon monoxide (CO) would not exceed 5 ppmvd (based on 15 percent oxygen) during normal operations.

SCR technology would be used for post-combustion NOx control, and an oxidizing catalyst for post-combustion CO control. Use of the oxidizing catalyst also would result in the reduction of Volatile Organic Compounds (VOCs).

The steam, once used by the steam turbines, is condensed via surface condensers and wet cooling towers. The source of cooling tower makeup (from evaporation and blowdown) would be groundwater. When the water in the cooling tower has been used and re-used to the point where the solids load would affect the efficient operation of the facility, it is discharged to evaporation pond(s).

The project is located in a remote portion of eastern La Paz County. Specifically, the facility would be located within the SW1/4 (160 acres) and S1/2, SE1/4 (80 acres) of Section 35, T3N, R11W. The generating facility (power blocks, buildings, tanks, cooling towers, and plant switchyard) would occupy approximately 40 acres, the evaporation ponds would occupy approximately 60 acres, and the 500kV switchyard would occupy approximately 20 acres at the point where it interconnects with the Palo Verde-Devers 500kV transmission line in Sections 24 and 25, T3N, R11W . A project location map is shown on Exhibit A-1, which depicts the proposed 240-acre generating facility site. Figure 1 is an aerial photograph of the proposed site, which illustrates the proposed 500kV transmission line interconnect, water supply system, including the 100-year floodplain, and proposed pipeline lateral interconnection. Additionally, Figure 1 illustrates the location of the supporting infrastructure including the Palo Verde-Devers 500kV transmission line, EPNG pipeline, and Interstate 10.

4.a.ii. Number and size of proposed units

The 1,080-MW (nominal) facility would consist of four identical natural gas-fired combustion turbines generators (CTG) and two identical steam turbine generators (STG).

4.a.ii.1 Combustion Turbine Generators (CTG)

Each CTG would consist of a Siemens Westinghouse Power Company (SWPC) W501F machine coupled with a SWPC 2-102x196 air-cooled generator rated at 224 MVA at a voltage of 16.5kV. Each CTG would be nominally rated at 180 MW (at 68 degrees Fahrenheit and 30 percent relative humidity), and would be fitted with inlet evaporative cooling to maintain capacity during peak periods where ambient conditions affect output.

4.a.ii.2 Steam Turbine Generator (STG)

Each STG would consist of a SWPC KN 8.7 steam turbine coupled to a SWPC 2-102x216 air cooled generator rated at 276 MVA at a voltage of 18kV. Each STG would be nominally rated at 180 MW without supplemental duct firing (SDF) and 255 MW with SDF.

The major equipment for each of the 6 units is shown on the general arrangement drawing, Exhibit G-1. Exhibit G-3 is an elevation drawing showing the height and relationships of buildings, the cooling towers and equipment. Minor configurations to the generating facility layout may be made during final design.

4.a.iii. The source and type of fuel to be utilized, including proximate analysis of fossil fuels.

The proposed generating facility would use natural gas delivered to the facility via EPNG interstate pipelines located approximately 5.5 miles south of the facility. The existing pipeline is shown on Figure 1. Proximate analysis of the gas that would be used at the proposed facility is shown in Table 4.a.iii.

TABLE 4.a.iii
PROXIMATE ANALYSIS OF NATURAL GAS

Natural Gas Component	Normalized Mol Percent
Methane	**96.93**
Ethane	**1.28**
Propane	**0.05**
Isobutane	**0.00**
n-Butane	**0.00**
Isopentane	**0.00**
n-Pentane	**0.00**
Hexane and Heavier	**0.00**
Carbon Dioxide	**1.45**
Nitrogen	**0.29**
Total	**100**

Diesel fuel would be used for the emergency fire pump and emergency generator. These pieces of equipment would be operated less than 50 hours per year for testing.

4.a.iv. Amount of fuel to be utilized daily, monthly and yearly.

Fuel utilization varies greatly with ambient conditions. Based on a 100 percent capacity factor at the CTG nominal rating point at 68 degrees Fahrenheit and 30 percent relative humidity, the utilization would be approximately as follows:

- Hourly - 7,884 mmbtu/hr (HHV)
- Daily – 189,216 mmbtu/day (HHV)
- Monthly - 5,759,262 mmbtu/mo (HHV)
- Annually - 69,063,840 mmbtu/yr (HHV)

Fuel use would vary with ambient conditions, actual operation hours and number of startups and shutdowns. Diesel fuel use would be minimal due to the unexpected emergency use of the fire pump and generator.

4.a.v. Type of cooling to be utilized and source of any water to be utilized.

Type of Cooling: The proposed facility would use mechanical draft (wet) cooling towers.

Source of Water: The proposed facility's water source would be groundwawter with augmentation by CAP water if and when necessary. Allegheny has acquired 2,325 acres of lands in the vicinity of the project within the Harquahala Basin that are eligible for irrigation under the requirements of the INA (A.R.S. § 49-437[B]). Allegheny intends to manage these lands so that they are not irrigated with groundwater during the life of the project. The lands may be irrigated with CAP water to maintain their existing agricultural uses. Allegheny's use of groundwater for the project would be in compliance with A.R.S. § 49-440(A), which provides for withdrawals of groundwater for commercial or industrial uses in an amount of 6 acre-feet in any year or a maximum of 30 acre-feet for any period of 10 consecutive years. CAP water would be secured to cover water use during extended peak operating periods (high temperatures or generation shortages) when duct-firing would increase water consumption. Allegheny intends to maintain access to CAP water via banking by a local CAP water recharge facility.

The water would be withdrawn from the aquifer and delivered to the project from a well field constructed in Section 1, Township 2 North, Range 11 West (T2N, R11W). The well field would consist of 5 wells spaced evenly on approximately 480 acres.

Water Discharge: The facility would not include a process or cooling water discharge. The applicant proposes to construct the necessary facilities (ponds, tanks, etc.) to achieve "zero discharge" capability.

Water Conservation Efforts: The proposed facility is designed to minimize the use of water, optimizing water recycling in the cooling system before discharging to evaporation ponds and minimizing the make-up water to the cooling towers. Allegheny is exploring the possibility of using a nearby water recharge facility in lieu of evaporation ponds. Under this scenario, water would be reused fewer times to maintain higher quality blowdown water that could be sent to the water recharge facility. Although reduced recycling increases groundwater withdrawal, the net effect of sending the blowdown water to the water recharge facility could reduce overall groundwater use by up to 20 percent.

4.a.vi. Proposed height of stacks and number of stacks, if any:

The project would have four stacks associated with CTG/HRSGs and one associated with the auxiliary boiler. The CTG/HRSG stacks would be 150 feet tall. The auxiliary boiler stack would be approximately 25 feet high.

4.a.vii. Dates for scheduled start-up and firm operation of each unit and date construction must commence in order to meet schedules:

The following dates are based on current firm contracted delivery dates of the CTGs and STGs with SWPC:

Start-up and first fire of power blocks (2CTGs/1STG):

- 1st 540-MW power block: July 30, 2004
- 2nd 540-MW power block: January 30, 2005

Firm Operation of each power block:

- 1st 540-MW power block: September 30, 2004
- 2nd 540-MW power block: March 30, 2005

Date Construction Must Commence:

- September 30, 2002

4.a.viii. To the extent available, the estimated costs of the proposed facilities and the site, stated separately. (If application contains alternative sites, furnish an estimate for each site and a brief description of reasons for any variations in estimates.)

The cost of the proposed facility (including 500kV transmission line interconnect, natural gas pipeline lateral, and ancillary facilities) is estimated to be greater than $500 million. The cost of the proposed facility site is estimated to be greater than $500 thousand.

4.a.ix. Legal description of proposed site. (If application contains alternative sites, list sites in order of applicant's preference with a summary of reasons for such order of preference and any changes such alternative sites would require in the plans reflected in (I) through (viii) hereof.)

SW1/4 of (160 acres) and S1/2, SE1/4 (80 acres) of Section 35, T3N, R11W, Gila and Salt River Baseline and Meridian in La Paz County, Arizona.

4.b. With respect to a proposed transmission line:

4.b.i. Nominal voltage for which the line is designed; description of the proposed structures and switchyards or substations associated therewith; and purpose for constructing said transmission line:

Nominal voltage: The transmission line interconnection would be 500kV alternating current.

Proposed Structures: Support structures would be either lattice or tubular steel designed for span lengths of approximately 1,000 feet. Structures would be located and designed to provide for a minimum of 35 feet of conductor-to-ground clearance at mid span. The precise placement of the structures would be based on engineering, economic, environmental, and safety considerations, along with stakeholder preferences. Structures are depicted in Exhibits G-5 and G-6. Typical heights would be 120 feet to the crossarm or low arm and 130 to 140 feet to the top of the structure.

Description of the proposed switchyards: The generating facility switchyard is of the open ring design. The 500kV interconnection switchyard is of the "breaker and a half" design.

Purpose for constructing said construction line: The line would be constructed to connect the proposed generating facility to the 500kV grid at the Palo Verde-Devers 500kV transmission line located approximately 1.75 miles from the proposed generating facility.

4.b.ii. Description of geographical points between which the transmission line will run, the straight-line distance between such points and the length of the transmission line for each alternative route for which application is made.

Description of geographical points between which the transmission line will run: The proposed 1.75-mile 500kV transmission line interconnect would be located adjacent to the east side of the Avenue 75E ROW. The transmission line would be constructed across private and state lands between the plant site in Section 35, T3N, R11W and the Palo Verde-Devers 500kV transmission line near the section line of Sections 24 and 25, T3N, R11W.

4.b.iii. Nominal width of right-of-way required, nominal length of spans, maximum height of supporting structures and minimum height of conductor above ground.

Nominal width of right-of-way required: 200 feet.

Nominal length of spans: 1,000 feet. This span will vary at the Interstate 10 crossing.

Maximum Height of Supporting Structures: 140 feet.

Minimum height of conductor above ground: 35 feet.

4.b.iv. To the extent available, the estimated costs of proposed transmission line and route, stated separately. (If application contains alternative routes, furnish an estimate for each route and a brief description of the reasons for any variations of such estimates.)

Transmission Line Costs: The estimated cost for transmission line construction is $800,000 per mile, exclusive of ROW acquisition costs, making the proposed transmission line interconnect approximately $1,400,000.

Routing Costs: Costs have not been developed due to pending negotiations with individual landowners.

4.b.v. Description of proposed route and switchyard locations. (If application contains alternative routes, list routes in order of applicants preference with a summary of reasons for such order of preference and any changes such alternative routes would require in the plans reflected in (i) through (iv) hereof.)

Description of proposed routes: Described in 4.b.ii above.

Description of Switchyard Locations: The switchyard for the plant would be located adjacent to the generation facility in Section 35, T3N, R11W. The transmission line interconnection switchyard (approximately 20 acres) would be located adjacent to the Palo-Verde Devers 500kV transmission line in the southwest corner of Section 24 and northwest corner of Section 25, T3N, R11W.

4.b.vi. For each alternative route for which application is made, list the ownership percentages of land traversed by the entire route (federal, state, Indian, private, etc.).

The transmission line interconnection would be located on approximately 43 percent State land in Section 36, T3N, R11W and 57 percent Private land in Sections 24 and 25, T3N, R11W.

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 proposed generating facility, pipeline lateral, and all transmission and switchyard alternatives fall within unincorporated areas of La Paz County. Allegheny has applied for a rezoning and special use permit from La Paz County, and the county has indicated no issues or conflicts with respect to any other zoning ordinances or master plans. It is anticipated that La Paz County will approve the rezoning and special use permit by September 2001.

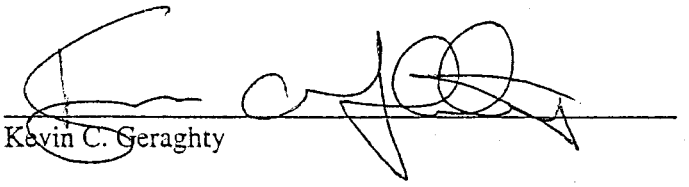
In addition to the above, La Paz has issued a special use permit and has rezoned the Allegheny well field site in Section 1, T2N, R11W.

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.*

See attached Exhibits.

Required environmental studies have been conducted for the Application for a Certificate of Environmental Compatibility pursuant to A.R.S. § 40-360.03 and 40-360.06. Additionally, there are numerous additional environmental studies that have been prepared in support of other permits (refer to Exhibits B-1, B-2, and B-3) as well as an economic study (Exhibit J-1).

Allegheny Energy Supply Company, LLC



Kevin C. Geraghty

Director, Western Region
Title

June 29, 2001
Date

EXHIBIT A—LOCATION MAP AND LAND USE INFORMATION

EXHIBIT A – LOCATION MAP AND LAND USE INFORMATION

In accordance with A.A.C. R14-3-219 Applicant provides the following location maps and land use information:

1. *"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."*

2. *"Where commercially available, a topographic map, 1:62,500 scale, of 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."*

3. *"Where commercially available, a topographic map, 1:250,000 scale, showing any proposed transmission line route of more than 50 miles in length and the adjacent area. For routes of less than 50 miles in length, use a scale of 1:62,500. If application is made for alternative transmission line routes, all routes may be shown on the same map, if practicable, designated by applicant's order of preference."*

4. *"Where commercially available, a topographic map, 1:62,500 scale, of each proposed transmission line route of more than 50 miles in length showing that portion of the route within two miles of any subdivided area. The general land use plan within the area shall be shown on a 1:62,500 map required for Exhibit A-3, and for the map required by this Exhibit A-4, 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 on an overlay."*

LAND USE OVERVIEW

The following exhibits are required by *Arizona Corporation Commission Rules of Practice and Procedure R14-3-219* to support the land use studies conducted for this application:

- Exhibit A-1 illustrates the project area on a 1:250,000 scale topographic map.

- Exhibit A-2 illustrates the proposed generating facility site, 500kV transmission line interconnection route, and natural gas pipeline lateral on a 1:62,500 scale topographic map. Additionally, Exhibit A-2 illustrates ownership and jurisdiction within the project area.

- Exhibit A-3 illustrates existing land uses surrounding the proposed generating facility site, 500kV transmission line interconnection route, and natural gas pipeline lateral on a 1:62,500 scale topographic map.

- Exhibit A-4 illustrates the La Paz and Maricopa County zoning classifications and planned land use near the proposed generating facility site, 500kV transmission line interconnection route, and natural gas pipeline lateral on a 1:62,500 scale topographic map.

The proposed generating facility site is located approximately 1 mile south of Interstate 10 at Exit 69 (Avenue 75E), approximately 21 miles southeast of the communities of Salome and Wenden, Arizona

(see Exhibit A-1). The proposed project falls entirely within unincorporated southeastern La Paz County (see Exhibit A-2). The project area consists of predominantly non-developed desert open space. Other land uses include agricultural land (production crops and livestock grazing), dispersed residences (40-acre lots), an RV park, and industrial uses. The industrial uses consist of the CAP canal, a water recharge facility, natural gas pipeline corridor and compressor station, 500kV transmission line, several aboveground well pumps, and several 12kV distribution lines. Interstate 10 bisects the project area, with local access served by the Exit 69 interchange at Avenue 75E.

Future land use designations consist primarily of rural low-density residential development (40-acre lots) with some areas designated for industrial use.

Potential impacts on existing and future land use resulting from the proposed project are predicted to be moderate to low. Strategic siting of the facility in areas designated or planned for industrial development has resulted in overall land use impacts which would be lower than those typically expected for a generating facility and 500kV transmission line interconnection.

INVENTORY METHODS

The inventory of existing and future land uses within the project area consisted of reviewing planning documents, maps, and aerial photography and conducting field visits. Additionally, data were supplemented and verified by personal communication with agency planning personnel. Data were collected for a 2-mile area surrounding the proposed generating facility site and 500kV transmission line interconnect; and for 1 mile surrounding the proposed pipeline lateral. Data were collected outside of these boundaries when needed to support the visual resource studies. Planning documents included La Paz and Maricopa County general land use plans and zoning ordinances, as well as Bureau of Land Management (BLM) Lower Gila South Resource Management Plan. Maps included USGS Topographic Quadrangle, La Paz County Assessor, and Ownership and Jurisdiction from the Arizona State Land Department. Digital aerial photography was obtained from Kenney Aerial Mapping for the years 1999 and 2001. Field visits were conducted during April and May of 2001 to confirm the inventory data captured from these sources. Relevant data were recorded on maps, photos, and tables for tracking and documentation purposes. A complete set of references is included at the end of this exhibit.

INVENTORY RESULTS

Proposed Generating Facility Site

The proposed generating facility site is located within the SW1/4 of (160 acres) and S1/2, SE1/4 (80 acres) of Section 35, T3N, R11W (see Exhibit A-3 and Figure 1). The proposed generating facility would occupy approximately 40 acres, with an additional 40 to 60 acres for an evaporation pond and/or auxiliary facilities. (Allegheny would develop a well field in Section 1, T2N, R11W [640 acres]). Allegheny currently owns the SW ¼ of Section 1, T2N, R11W (160 acres) and has initiated a land exchange with the BLM to acquire the remaining 480 acres of land in Section 1, T2N, R11W. Land in each of these sections is a typical Sonoran desert scrub landscape, with Centennial Wash covering a small portion of the southwest corner of each section.

The SW ¼ of Section 1, T2N, R11W (160 acres) is currently zoned for heavy industrial use by La Paz County and has a special use permit to site a power plant. The SW1/4 of (160 acres) and S1/2, SE1/4 (80 acres) of Section 35, T3N, R11W is currently in the process of being rezoned for heavy industrial use by La Paz County (see Exhibit A-4).

Property surrounding the proposed generating facility site consists of a combination of private, State, and BLM lands (see Exhibit A-2). Dominating land uses surrounding the proposed generating facility site include agricultural land currently used for crop production, livestock grazing, irrigation ditches, and water wells/pumps, as well as non-developed desert open space including Centennial Wash. The closest residence is approximately 1.75 miles north of the proposed generating facility site on the opposite side of Interstate 10. Snowbird West RV Park and six residences are located north of the CAP canal approximately 2.75 to 3 miles from the proposed generating facility site. Six additional residences are located near Centennial Wash, approximately 4.5 miles southeast of the proposed generating facility site. All residences appear to be permanent or year-round with the exception of Snowbird West RV Park. A grazing permit exists for the BLM land (480 acres) in Section 1, T2N, R11W.

Major transportation corridors near the generating facility include Interstate 10 with a seasonal daily traffic volume of approximately 10,000 to 20,000 (ADOT 1996) and Salome Road with a seasonal daily traffic volume of 1,200 (La Paz County 2001) Avenue 75E provides access to the generating facility and to the Snowbird West RV Park from the Exit 69 interchanges along Interstate 10.

There are several industrial features located adjacent to the generating facility including the following:

- water recharge facility (approximately 1 mile west of the proposed generating facility site in Section 33, T3N, R11W)
- CAP canal (approximately 1.75 miles north of the proposed generating facility site)
- Palo Verde-Devers 500kV transmission line (approximately 1.75 miles north of the proposed generating facility site)
- multiple 12kV transmission lines
- several borrow pits/extraction areas

There are no developed recreation areas near the generating facility. Dispersed recreation uses include off-highway vehicle use, hunting, hiking, walking, and wildlife viewing along Centennial Wash and Avenue 75E.

The area surrounding the generating facility site is currently zoned for rural low-density (40-acre lots) residential development (see Exhibit A-4). Although there are no formal future land use plans, La Paz County has expressed interest in expanding commercial and industrial development south of Interstate 10 along Avenue 75E. It is likely that the area will see additional residential development north of Interstate 10 as well.

Allegheny has obtained the necessary ROW across State and private land for upgrading (i.e., paving and widening) Avenue 75E from Exit 69 along Interstate 10 to the proposed generating facility site.

Proposed 500kV Transmission Line Interconnect (Route A)

The proposed 500kV transmission line interconnect would require a ROW 1.75 miles long by 200 feet wide, or approximately 42 acres, across State (ASLD and ADOT) and private lands paralleling the east side of Avenue 75E. There would be approximately 10 self-supporting steel-lattice structures located within the ROW. Currently the State land is used for agricultural crops and the private land is undeveloped desert open space (see Exhibit A-3 and Figure 1). The proposed transmission line interconnect would require an aerial easement where it crosses Interstate 10 adjacent to the Exit 69

interchange. The closest resident is approximately 0.25 mile northwest of the proposed transmission line interconnect on the opposite side of the Palo Verde-Devers 500kV transmission line. There are no developed recreation areas along the proposed transmission line interconnect route. Future land use plans along the ROW are currently designated by La Paz County for rural low density (40-acre lots) residential development (see Exhibit A-4).

Proposed 500kV Switchyard Site

The proposed 500kV switchyard site would be located at the southeast corner of the intersection of the proposed 500kV transmission line interconnect and the Palo Verde-Devers 500kV transmission line. The proposed switchyard would require purchasing 20 acres of private land which is currently undeveloped desert open space (see Exhibit A-3 and Figure 1). The closest resident is approximately 0.25 mile northwest of the proposed switchyard site on the opposite side of the Palo Verde-Devers 500kV transmission line. There is a small livestock corral located north of the Palo Verde-Devers 500kV transmission line and adjacent to the CAP canal. There are no developed recreation areas within the proposed switchyard site.

The proposed switchyard site is designated by La Paz County for rural low density (40-acre lots) residential development (see Exhibit A-4).

Proposed Natural Gas Pipeline Lateral (Route B)

The generating facility would require construction of a 5.5-mile underground natural gas pipeline lateral connecting with the existing EPNG pipeline. The gas pipeline lateral would require 3.5 miles of ROW across State land and 2 miles across private land. The ROW would be approximately 100 feet wide and would amount to approximately 65 acres. The proposed pipeline lateral would not cross BLM lands.

Land along the proposed pipeline lateral corridor is primarily undeveloped desert open space supporting some livestock grazing. The proposed pipeline lateral would be directionally bored under 0.25 mile of Centennial Wash.

There are dispersed recreational uses along the proposed pipeline lateral consisting mainly of off-highway vehicle use and hunting primarily along Centennial Wash. The Eagletail Mountains Wilderness (managed by BLM) is located approximately 2 to 3 miles south/southwest of the proposed pipeline lateral. Recreational uses found within the wilderness area include hiking, biking, wildlife viewing, viewing of petroglyphs, and camping.

La Paz County designates the proposed pipeline lateral corridor for rural low density (40-acre lots) residential development (see Exhibit A-4).

ASSESSMENT METHODOLOGY

Methods

The assessment of impacts required a comprehensive inventory of existing and future land uses in areas where the proposed generating facility, 500kV transmission line interconnect and switchyard, and pipeline lateral would be located. Information gathered during the inventory was reviewed for potential impacts on existing land use resulting from the construction, operation, and maintenance of the project. The project was also compared with future land use plans to determine the compatibility or potential conflicts with plans for the project area.

The anticipated physical impacts on land uses are based on the locations where the proposed project would occur. The sensitivity of nearby land uses within the region of influence also was considered if the proposed project would be anticipated to interfere with the function of that land use. Duration of impact also was considered. Long-term impacts are those that would be permanent or those that would last for the life of the proposed project and short-term impacts are those associated with construction.

Impacts are described in terms of high, moderate, and low for each aspect of the proposed project. High impacts would be the most severe and low would be the ornate. High impacts would typically occur if there was a removal or displacement of sensitive land uses, such as existing or future (approved) residences or designated recreation areas. Moderate impacts would occur if there were a removal of moderately sensitive land, such as commercial development and future (conceptually designated) residential areas. Low impacts typically occur if there is minimal to no disturbance of a moderately sensitive resource or displacement of another low sensitivity use (e.g., mining/extraction areas, grazing areas, agricultural uses, utility corridors).

MITIGATION MEASURES

The following mitigation measures will be implemented to reduce impacts to existing and future land uses that may result due to the construction, operation, and maintenance of proposed project.

1. The plant will comply with all applicable La Paz County zoning regulations for heavy industrial use (La Paz County Planning Division, 1996) including:

    - Front Setback—20 feet
    - Side Setback—5 feet abutting residential zones, otherwise zero
    - Rear Setback—20 feet abutting residential zones, otherwise zero except that dwelling in HI require 5 feet
    - Height limits—45 feet

      Buildings may exceed the stated height limit if:

      The total floor area of all levels of the building is less than or equal to 20 percent of the total lot area on which the building is located

      or

      The building is set back from all property lines a distance of 25 feet plus 1 additional foot for each foot of building height exceeding 45 feet

    - Where there is an industrial zone bounded by any residential zone, a 6-foot-high sight-obscuring wall or fence is required.

2. A landscaping plan will be generated for the generation facility site.

3. Neutral color schemes will be used for generation facility equipment.

4. Areas disturbed during construction and not required for operation and maintenance will be revegetated.

5. Sensitive features (e.g., Interstate 10) will be spanned by the proposed 500kV transmission line interconnect to avoid disturbance or displacement.

6. Centennial Wash will be directionally bored to minimize disturbance.

ASSESSMENT RESULTS

Proposed Generating Facility Site

Short-term and long-term impacts resulting from the proposed generating facility would be low. The generating facility is located on land designated [SW ¼ of Section 1, T2N, R11W (160 acres)] or planned [SW1/4 of (160 acres) and S1/2, SE1/4 (80 acres) of Section 35, T3N, R11W] for heavy industrial use. Currently these lands consist of undeveloped desert open space (primarily desert scrub). Additionally, the generating facility would avoid Centennial Wash and the associated 100-year floodplain.

There would not be displacement of residences or other private land as a result of the proposed generating facility. Nearby BLM-managed lands are utilized for livestock grazing, provide dispersed recreation uses, and allow for access to public and private lands. With one exception, existing uses (e.g., residences, recreation, agriculture) on private and public land would not change or be impacted as a result of the proposed generating facility. The exception would result if the BLM land exchange within Section 1, T2N, R11W (480 acres) takes place. The grazing permit would be terminated so that a well field could be established resulting in low to moderate impacts on ranching activities, since it represents a relatively small percentage of land with minimal grazing value.

Improved access along Avenue 75E would increase access south of Interstate 10. This would result in low impacts on existing land uses and may benefit the area if there are future commercial and industrial developments in this area.

Proposed 500kV Transmission Line Interconnect (Route A)

Short-term and long-term impacts associated with the proposed 500kV transmission line interconnect would be moderate to low. Moderate impacts would occur for agricultural land east of Avenue 75E, primarily due to restrictions placed on aerial application (crop dusting) of pesticides during periods of crop production. The proposed transmission line interconnect would prevent east/west flight paths, but north/south flight paths would still be available. Impacts resulting from displacement of undeveloped desert open space (primarily desert scrub) would be low. Impacts crossing Interstate 10 would be low, since the crossing would not impact the flow or traffic or safety of travelers using the roadway. Existing residences and designated recreation areas would not be impacted.

Moderate impacts would result for lands conceptually designated by La Paz County for rural residential development, since the proposed transmission line interconnect would restrict residential development within the ROW.

Proposed 500kV Switchyard

Short-term and long-term impacts associated with proposed 500kV switchyard would be moderate to low. Impacts resulting from displacement of undeveloped desert open space (primarily desert scrub) would be low. Existing residences and designated recreation areas would not be impacted.

Moderate impacts would result for lands conceptually designated by La Paz County for rural residential development, since the proposed switchyard would restrict residential development within the ROW.

Proposed Natural Gas Pipeline Lateral (Route B)

Short-term and long-term impacts associated with proposed pipeline lateral would be moderate to low. Impacts resulting from displacement of undeveloped desert open space (primarily desert scrub) would be low. Impacts on Centennial Wash would be low since it would be directionally bored allowing for no ground disturbance within the wash. Existing residences and designated recreation areas would not be impacted.

Moderate impacts would result for lands conceptually designated by La Paz County for rural residential development, since the proposed pipeline lateral would restrict residential development within the ROW.

CONCLUSIONS

The proposed project would not result in adverse impacts to existing and future land use. The proposed generating facility would result in low impacts to land use since it is located on vacant undeveloped desert scrub land, planned for industrial development by La Paz County. Moderate impacts would occur where the proposed 500kV transmission line interconnection displaces agricultural land and areas conceptually designated for future low-density residential development. Moderate impacts would occur to areas conceptually designated for future low-density residential development due to the proposed 500kV switchyard. The remaining impacts to land use resulting from the proposed project would be low. Overall land use impacts would be lower than those typically expected for a generating facility and 500kV transmission line interconnection.

REFERENCES

Arizona Department of Transportation, 1996. Traffic Count Study.

Arizona State Land Department, Ownership 1996.

Bureau of Land Management, February 2000.

Kenney Aerial Photography, 2001.

Kenney Aerial Photography, 1999.

La Paz County Zoning Regulations. La Paz County. July 31, 1996.

Lower Gila South. Resource Management Plan Environmental Impact Statement Phoenix District, Arizona. February 1, 1985.

Final Amendment and Environmental Assessment to the Lower Gila North Management.

Framework Plan and the Lower Gila South Resource Management Plan.

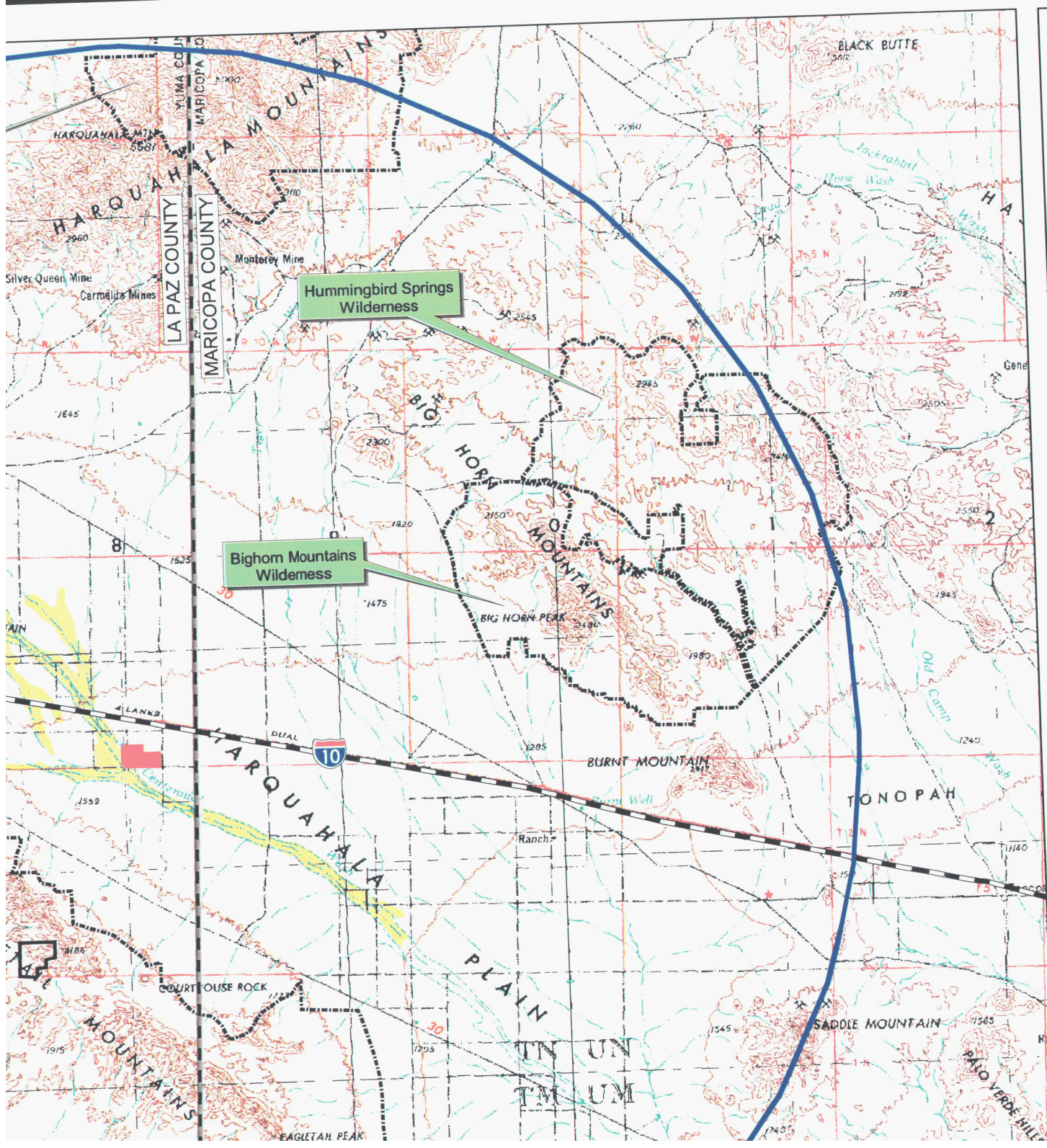
Personal communication with Kyle Mahan, Bureau of Land Management, May 30, 2001.

Personal communication with Tom Simmons, La Paz county, June 12, 2001.

Exhibit A-1
General Project Location

La Paz Generating Facility

Allegheny Energy Supply
an Allegheny Energy company



Legend

- Generating Facility Site
- Wilderness Boundary
- 20 Mile Site Buffer

General Project Location In Arizona

Sources:
USGS, Phoenix 1x2 Degree Quadrangle, Revised 1969.

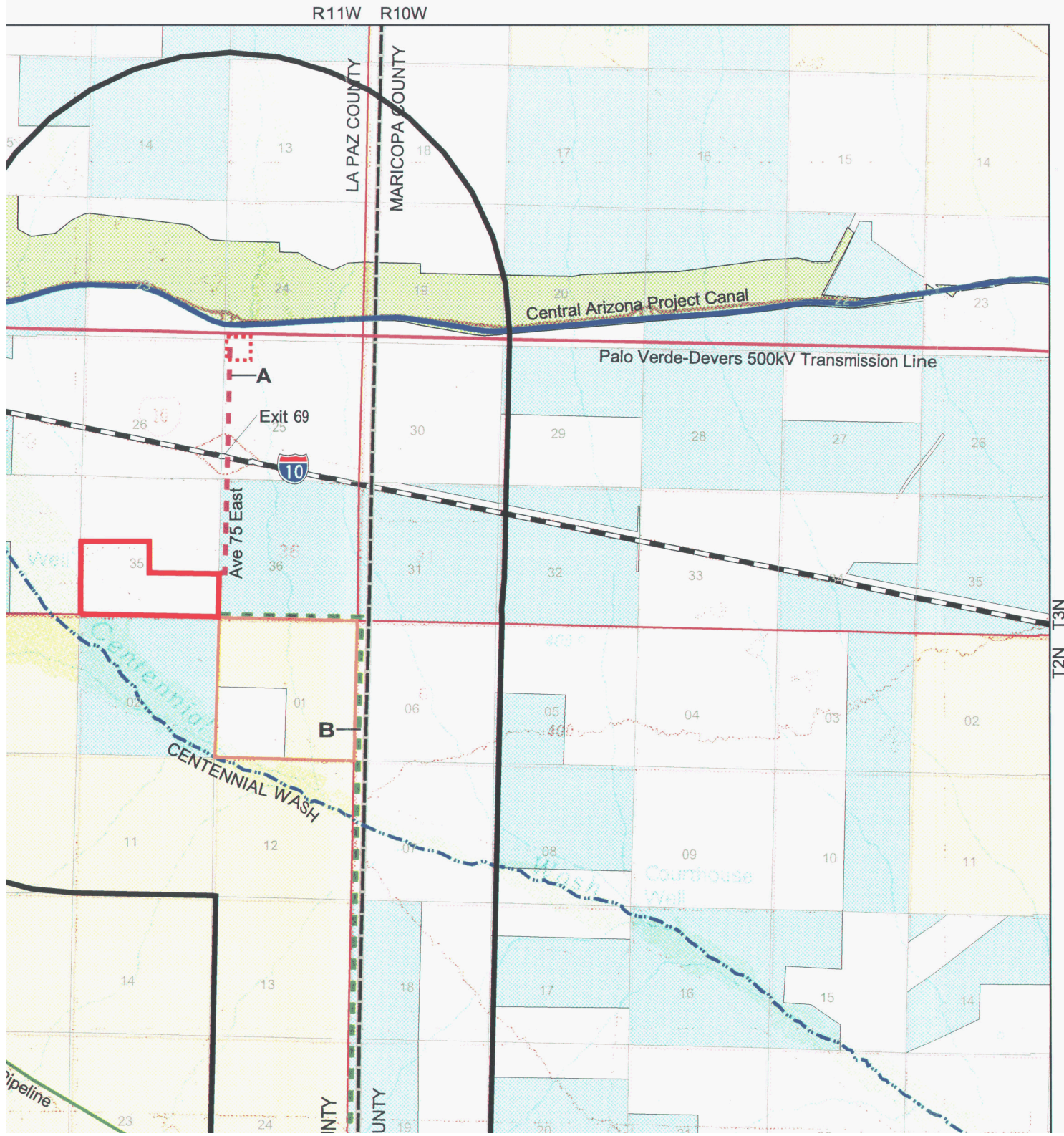


Exhibit A-2
Ownership and Jurisdiction

La Paz Generating Facility

Allegheny Energy Supply
an Allegheny Energy company

Legend

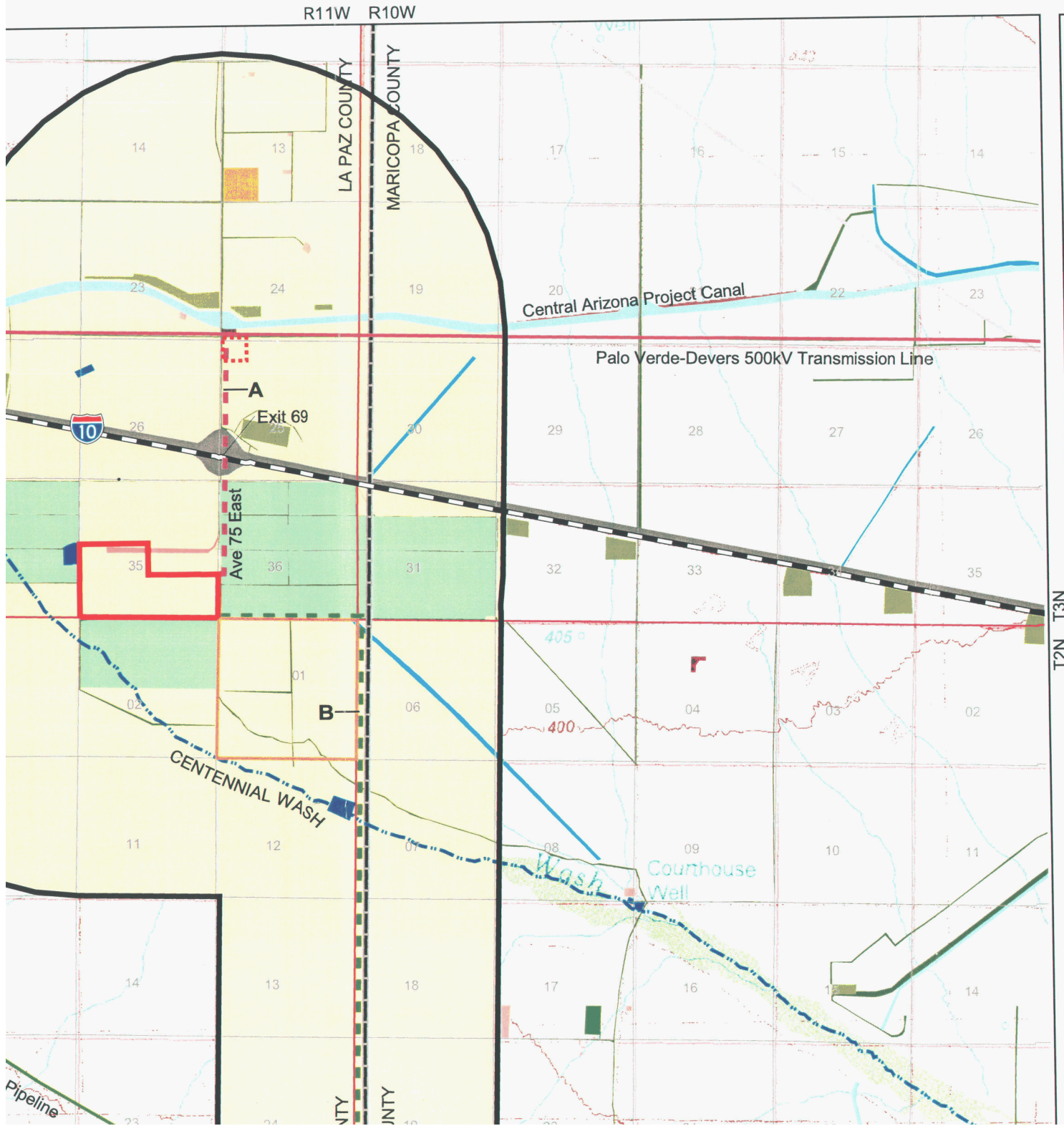
- Bureau of Land Management
- State Trust Lands
- Private Lands
- Bureau of Reclamation
- Project Area Boundary
- Generating Facility Site
- Well Field
- Proposed Switchyard
- Township and Range Lines
- 26 Section Lines and Numbers
- County Boundary
- Interstate Highway
- Central Arizona Project Canal
- Centennial Wash
- Proposed Gas Pipeline
- EPNG Pipeline
- Proposed 500kV Transmission Line
- Palo Verde-Devers 500kV Transmission Line

Source:
Arizona State Land Dept., Ownership, 1996.
USGS, Little Horn Mountains 30x60 Minute Quad, Revised 1988.
USGS, Salome 30x60 Minute Quad, Revised 1984.

Exhibit A-3
Existing Land Use

La Paz Generating Facility

Allegheny Energy Supply
an Allegheny Energy company



Legend

- Undeveloped Open Space
- Single Family Dwelling
- RV Park/Mobile Home Park
- Borrow Pit
- Airfield/Airstrip
- Fallow Farmland
- Outstructure (Silo, Barn, Corral)
- Farm Complex
- Flood Control Facility
- Canal
- Recharge Area
- Water Tower/Tank
- Interstate Highway
- Secondary Roads
- Gravel/4-Wheel Drive Roads
- Project Area Boundary
- Generating Facility Site
- Proposed Switchyard
- Well Field
- Township and Range Lines
- 26 Section Lines and Numbers
- Interstate 10
- Centennial Wash
- Proposed Gas Pipeline
- EPNG Pipeline
- Proposed 500kV Transmission Line
- Palo Verde-Devers 500kV Transmission Line

Source:
USGS, Little Horn Mountains 30x60 Minute Quad, Revised 1988.
USGS, Salome 30x60 Minute Quad, Revised 1984.

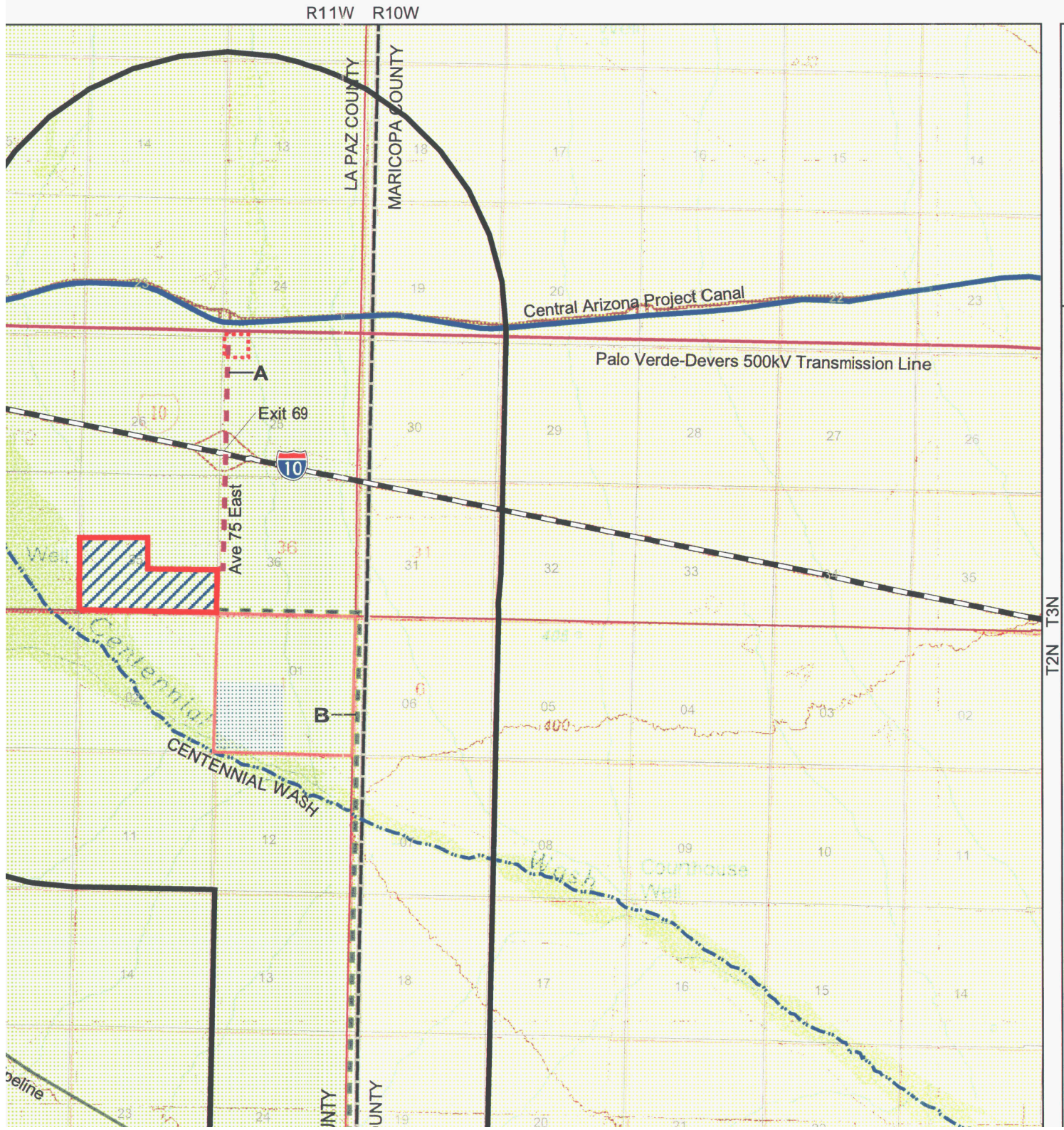


Exhibit A-4
La Paz/Maricopa County Zoning and Planned Land Use

La Paz Generating Facility

Allegheny Energy Supply
an Allegheny Energy company

Legend

- R1-90 (Rural Residential) Maricopa County
- RA-40 (Rural Residential) La Paz County
- HI (Heavy Industrial) La Paz County
- Planned HI (Heavy Industrial) La Paz County
- Project Area Boundary
- Generating Facility Site
- Proposed Switchyard
- Well Field
- Township and Range Lines
- 26 Section Lines and Numbers
- County Boundary
- Interstate Highway
- Central Arizona Project Canal
- Centennial Wash
- Proposed Gas Pipeline
- EPNG Pipeline
- Proposed 500kV Transmission Line
- Palo Verde-Devers 500kV Transmission Line

Source:
USGS, Little Horn Mountains 30x60 Minute Quad, Revised 1988.
USGS, Salome 30x60 Minute Quad, Revised 1984.

EXHIBIT B—ENVIRONMENTAL STUDIES

EXHIBIT B—ENVIRONMENTAL STUDIES

As required by A.A.C. R14-3-219 Applicant provides the following information:

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 a part of this exhibit.

The following environmental studies are attached:

- Exhibit B-1 Air Quality Studies and Resources
- Exhibit B-2 Cultural Resources
- Exhibit B-3 Water Supply

EXHIBIT B-1—AIR QUALITY STUDIES AND RESOURCES

AIR QUALITY STUDIES AND RESOURCES FOR THE LA PAZ GENERATING FACILITY

June 18, 2001

Prepared for:

Allegheny Energy Supply
La Paz Generating Facility
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APPENDICES INCLUDED IN SEPARATE SUPPORT DOCUMENT

A EPA-RBLC AND ARIZONA NO_X BACT FINDINGS FOR GAS TURBINES
B COST ESTIMATES
C EPA-RBLC AND ARIZONA CO BACT FINDINGS FOR GAS TURBINES
D EPA-RBLC AND ARIZONA PM_{10}, SO_2 AND VOC BACT FINDINGS FOR GAS TURBINES
E CARB AND TNRCC NO_X, CO, PM_{10}, SO_2 AND VOC BACT FINDINGS FOR GAS TURBINES
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EXECUTIVE SUMMARY

This document presents the results of studies related to air quality for the proposed La Paz Generating Facility. The document contains three main analyses including: (a) Best Available Control Technology (BACT), (b) Emissions Inventory, and (c) Air Impact Analysis.

BACT

The BACT analysis presents an evaluation of currently permitted control technologies for equipment similar to that proposed for the La Paz Generating Facility. The BACT was evaluated for the combustion turbine generator/heat recovery steam generator (CTG/HRSG) units, the cooling towers, the auxiliary boiler, and the emergency generators. The proposed BACT summarized below will control criteria pollutant emissions to levels equal to or less than those proposed by recently permitted natural gas-fired electrical generating facilities similar to the La Paz Generating Facility.

The proposed BACT to control emissions from the CTG/HRSG units is (a) dry low-NO_x burners with selective catalytic reduction and ammonia injection, (b) catalytic oxidation, (c) good engineering practices, and (d) sulfur content in the natural gas equal to or less than 0.75 gr-S/100scf. The proposed BACT is estimated to control emissions to: (a) 2.5 ppmvd for NO_x, (b) 5.0 ppmvd for CO, (c) 0.0158 lbs/MMBtu for PM_{10}, (d) 0.0024 lbs/MMBtu for SO_2, (e) 2.9 ppmvd for VOC, and (f) 10.0 ppmvd for ammonia.

The proposed BACT to control emissions from the cooling towers is drift eliminator control technology that is estimated to control PM_{10} emissions to 3.39 lb/hr for each of the two cooling towers. The proposed BACT to control emissions from the auxiliary boiler is dry low-NO_x burners, good combustion techniques, and low sulfur content in the natural gas. The proposed BACT for the auxiliary boiler is estimated to control emissions to: (a) 0.1 lbs/MMBtu for NO_x, (b) 0.06 lb/MMBtu for CO, (c) 0.01 lb/MMBtu for PM_{10}, (d) 0.0025 lb/MMBtu for SO_2 and (e) 0.015 lb/MMBtu for VOC. The proposed BACT for the emergency generators is low sulfur diesel fuel and good combustion techniques. The generators would be operated less than 500 hours per year and emissions would be minimal.

Emissions Inventory

The emissions inventory summarizes hourly and annual criteria pollutant emission rates from each emissions unit based on the proposed BACT. The inventory also includes summaries of the CTG/HRSG unit start-up emission rates and hazardous air pollutant (HAP) emission rates. The annual criteria pollutant potential to emit for the La Paz Generating Facility will be: (a) 412 tpy for NO_x, (b) 881 tpy for CO, (c) 535 tpy for PM_{10}, (d) 81 tpy for SO_2, and (e) 202 tpy for VOC. The total of all HAPs for the facility is less than 25 tpy and no individual HAP total is above 10 tpy.

Air Impact Analysis

The La Paz Generating Facility will be a new major source and subject to Prevention of Significant Deterioration (PSD) requirements. The objective of the air impact analysis was to quantify the maximum predicted ambient impacts due to emissions from the facility for comparison with applicable (a) National Ambient Air Quality Standards (NAAQS), (b) PSD increments, and (c) Arizona Ambient Air Quality Guideline (AAAQG) concentrations. The analysis also included an

evaluation of ambient and visibility impacts in five Class II Wilderness Areas located within 50 km of the proposed facility location.

The proposed facility location is greater than 50 km from the closest non-attainment areas and greater than 150 km from the closest Class I Wilderness Areas. Per agreement with the Arizona Department of Environmental Quality, the impact analysis did not include evaluations of these areas because of the distances from the proposed facility location.

The analysis showed that the highest impacts among the criteria pollutants evaluated were well below the applicable standards, ranging from 4% (SO_2 24-hr avg.) to 42% (PM_{10} 24-hr avg.) of the applicable NAAQS and from 3% (SO_2 24-hr avg.) to 38% (NO_x annual avg.) of the applicable PSD Increments. The AAAQG analysis also showed impacts well below the applicable thresholds.

Ambient impacts in the Class II Wilderness Areas that were evaluated were well below the applicable Class II significant impact levels. Impacts in the Eagletail Mountains Wilderness Area, which is the closest,, ranged from 3% (SO_2 annual avg.) to 50% (PM_{10} 24-hr avg.) of the applicable levels. The results for the Level 2 visibility screening showed that the screening criteria for plume perceptibility were not exceeded in any of the Class II Wilderness Areas that were evaluated.

INTRODUCTION

This document is composed of three separate analyses titled: (a) Best Available Control Technology (BACT), (b) Emissions Inventory, and (c) Air Quality Impacts. All appendices associated with this document have been combined into a separate document titled: *Support Data for Exhibit B-1, Air Quality Studies and Resources, Appendices A-P.*

The La Paz Generating Facility will be located in the southeast quarter of Section 35, Township 3 North, Range 11 West, approximately 1.6 kilometers south of Interstate 10 at Exit 69 (Figure B-1.1). The proposed facility location is at an elevation of approximately 410 meters above sea level. The immediate terrain surrounding the proposed facility consists of checkerboard natural desert and agricultural flat lands. The proposed facility is a natural gas-fired, combined cycle electric generation facility with two power blocks, each rated at 540 MW for a maximum facility rating of 1,080 MW at design ambient conditions. Each power block will consist of the following equipment:

- two Siemens-Westinghouse (SW) 501FD Combustion Turbine Generators (CTGs) with dry low-NO_x combustion systems;
- two Heat Recovery Steam Generators (HRSGs) with supplemental duct firing and low-NO_x burners; and
- one Steam Turbine Generator (STG).

Support processes at the facility will include the following equipment:

- two, 9-cell cooling towers, each with a circulation rate of approximately 152,550 gal/min and equipped with high efficiency drift eliminators;
- one auxiliary boiler with a maximum natural gas fuel burn rate of 55.34 MMBtu/hr equipped with low-NO_x burners;
- two emergency diesel generators, one for each block, each rated at 1,000 KW; and

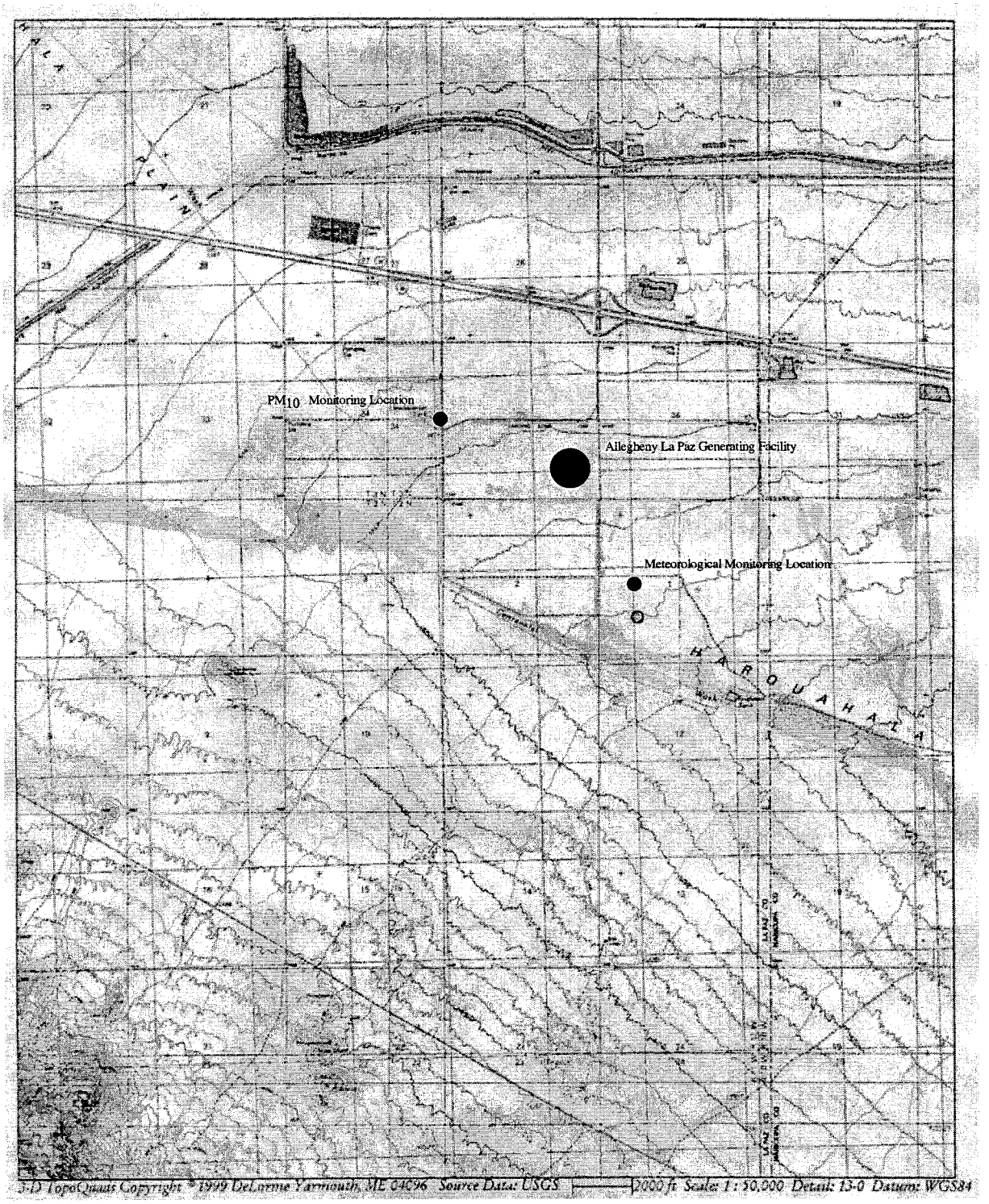


Figure B-1.1. Topographic map showing location of the La Paz Generating Facility and meteorological and PM_{10} monitoring sites.

- two emergency diesel fire pumps, one for each block, each rated at 250 HP.

The emergency fire pumps are considered an insignificant activity as defined in R18-2-101.54 and therefore, emissions from the fire pumps were not included in the modeling.

The term "combined-cycle" refers to the concurrent use of two thermodynamic cycles known as the Brayton and Rankine cycles. The Brayton cycle refers to the electricity generated by the combustion of natural gas in the CTGs. The Rankine cycle refers to the electricity generated by steam passing through the STG. The basic combined cycle process is as follows.

The CTGs operate by compressing cooled air that is mixed with natural gas and burned in the low-NO_x combustor of the CTG. These heated gases pass through the power turbine which drives a compressor and generator. The CTG generator produces approximately 180 MW under 100% load and average ambient temperatures (the Brayton cycle). The CTG gases exhaust to the HRSG which generates steam from the heat of the exhaust gases. The steam is then used to drive the STG which is capable of generating approximately 300 MW under 100% load and average ambient temperatures, with duct firing (the Rankine cycle). The HRSGs utilize supplemental duct firing of natural gas to increase the temperature of the CTG exhaust gases in order to produce addition steam for the STG and thus, increase the overall output from the facility. The low pressure, low temperature steam passing through the STG is condensed in the main condenser, and then recycled to produce more steam. The condenser is cooled with water that is then circulated through the cooling towers whereby heat is removed through evaporation.

The facility will emit nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter less than or equal to 10 microns nominal aerodynamic diameter (PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOCs) emissions.

BACT ANALYSIS

BACT Regulatory Requirements

Section R18-2-406(A) of the Arizona Administrative Code (AAC) provides the regulatory framework necessary to obtain a permit for the construction of a new major source or make a major modification to a major source that would be constructed in an area designated as attainment or unclassifiable for any pollutant. Among many other specific requirements, Section R18-2-406(A) states that any new major source shall apply BACT for each of the applicable pollutants for which the potential to emit (PTE) is significant (equals or exceeds the significant emission rates). This requirement applies to each emissions unit at the facility that emits the applicable pollutant.

The AAC defines BACT (R18-2-101(19)) as "an emission limitation, including a visible emissions standard, based on the maximum degree of reduction for each pollutant listed in R18-2-101(97)(a) which would be emitted from any proposed major source or major modification, taking into account energy, environmental, and economic impact and other costs, determined by the Director in accordance with R18-2-406(A)(4) to be achievable for such source or modification."

The AAC further states (R18-2-406(A)(4)), "BACT shall be determined on a case-by-case basis and may constitute application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment, clean fuels, or innovative fuel combustion techniques, for control of such pollutant... If the Director determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational

standard, or combination thereof may be prescribed instead to satisfy the requirement of the application of BACT."

Emission Units Subject to BACT

As shown in the emissions inventory presented below, the PTE for the CTG/HRSG units exceeds the applicable significant emission rates for BACT. Consequently, all emission units that emit these pollutants are subject to the BACT analysis. These include the CTGs, HRSGs, the cooling towers, the auxiliary boiler and the emergency generators.

BACT Selection Procedure

The BACT selection process utilizes the "top-down" method for determining *all* available control technologies ranked in descending order of control effectiveness. In the "top-down" approach the most stringent control technology is the "top" alternative for BACT unless the applicant demonstrates, with agency approval, that technical, energy, environmental, or economic considerations justify a conclusion that the top alternative is not achievable. If the most stringent alternative is eliminated then the next most stringent alternative is BACT. This continues until the BACT is achievable and not eliminated by previous considerations. A description of the BACT analysis procedures is presented below.

Step 1 – Identify All Control Technologies

For each emissions unit, all available control technologies are identified. Available control technologies are pollution control technologies and or techniques that can be practically applied to a source for controlling the applicable pollutant. References used to identify these sources include the following: EPA - RACT/BACT/LAER Clearinghouse (RBLC), California Air Resources Board (CARB) BACT Clearinghouse, Texas Natural Resource Conservation Commission (TNRCC), recently submitted BACT analyses for similar projects, and review of vendor provided information. Appendices A-G present BACT determinations for gas turbines, cooling towers and natural gas fired boilers.

Step 2 – Eliminate Technically Infeasible Options

The technical feasibility of the control option is evaluated with respect to physical, chemical and engineering principles that would prevent the successful implementation of the control technology. Technically feasible technologies include those technologies that have been demonstrated on the type and size of equipment that will be used by the source being permitted. The control technology must be available for purchase, as the source need not have to wait or expend resources for a control technique to become commercially available.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Control technologies not eliminated by Step 2 are then listed by the "top-down" procedure.

Step 4 – Evaluate Most Effective Controls and Document Results

For each control technology remaining after Step 3, an evaluation is performed with respect to energy, environmental and economic impacts. Beneficial and negative impacts are discussed in relation to the "top-down" group. Once a control technology is shown to not be appropriate due to a negative impact, the next alternative down is chosen and so on. The process is complete when a

control technology has no negative source-specific energy, environmental or economic impact and is then chosen as the top BACT.

Assumptions for Analysis

The BACT analysis presented herein was based on the following assumptions:

- the CTGs, duct burners for the HRSGs and auxiliary boiler will utilize pipeline grade natural gas with a sulfur content less than 0.75 gr-S/100scf; and

- emissions for the CTG/HRSG units are based on continuous operation (8760 hours/year), under 100% load with duct firing, and average ambient temperatures (72 °F).

The BACT review was performed on turbines with greater than 100 MWe output. The economic criteria used to determine costs of the control technologies was based upon the (a) Office of Air Quality and Planning Standards (OAQPS) Control Cost Manual (CCM), 5th Edition, (b) EPA BACT Guidelines, (c) estimates available from EPA's Clean Air Technology Center (CATC) database, (d) project development cost factors and (e) vendor supplied cost estimates. The CCM Factor Tables are presented in Appendix A.

Cost evaluations for the BACT analysis were performed according to the (a) OAQPS CCM, (b) Cost-Effectiveness of Oxidation Catalyst Control of Hazardous Air Pollutant (HAP) Emissions From Stationary Combustion Turbines (Cost-Effectiveness Guideline), September 4, 1998, (c) vendor quotes, (d) the CATC database, and (e) Alternative Control Techniques Document—NO_x Emissions from Stationary Gas Turbines EPA-453/R-93-0007, January 1993.

Capital costs are the initial costs associated with purchasing the control equipment and installation costs. Annualized costs include direct costs such as labor, replacement parts, raw materials, utilities, maintenance, and waste disposal. Indirect annualized costs include plant overhead, taxes, insurance, administration and capital charges. The cost estimation factors used to compute costs are presented in Table B-1.1. Updated costs include the costs associated with the pressure drop across a catalyst. A fuel penalty is assessed as the cost of increased fuel usage. This is calculated by assuming a percent heat increase due to the increased pressure drop and increased exhaust backpressure on the CTG. Also, a secondary cost is included with lost electricity sales by deceasing CTG performance from control system backpressure. Since the La Paz Generating Facility is in the early planning stages, preliminary (i.e., budgetary) quotations were obtained for control equipment costs and were used to develop capitol cost summaries. Therefore, a contingency factor of 20% was utilized.

BACT for CTG/HRSG Units

NO_x BACT Analysis

This section describes the NO_x BACT for large CTG/HRSG systems.

NO_x Control Alternatives

The latest EPA-RBLC, CARB BACT, recent Arizona, and vendor supplied NO_x BACT findings for gas turbines is presented in Appendix B. Identification of the various NO_x control technologies applicable to large combined cycle turbines includes the following descriptions:

Combustor NO_x Controls

Combustion control techniques reduce the concentrations of NO_x emissions in the gas turbine flue gas by decreasing the temperature or quantity of oxygen during fuel combustion.

Diluent Injection

Diluent injection involves the injection of water or steam into the vicinity of the combustor burner flame. Lowering the temperature in the combustion zone with water or steam reduces NO_x emissions. Diluent injection control systems have been shown to reduce NO_x emissions to 25 ppmv.

TABLE B-1.1
CCM, COST-EFFECTIVENESS GUIDELINE, AND BLACK & VEATCH COST ESTIMATE FACTORS

Economic Parameters	Value	Source
Contingency (%)	20	Cost-Effectiveness, Page 12
Real Interest Rate (%)	7	CCM, Page 2-12
Economic Life (years)	10	CCM, Page 3-54
Capital Recovery Factor (10 years)	0.142	CCM, Page 2-12
Capital Recovery Factor (3 years)	0.381	CCM, Page 2-12
Labor Cost ($/man-hr)	45	Estimated by Black & Veatch
Labor (hrs/yr)	730	Cost-Effectiveness, Page 14
Natural Gas Cost ($/MMBtu)	5.00	Estimated by Black & Veatch
Aqueous Ammonia Cost ($/ton, 2001)	300	Estimated by Black & Veatch
Energy Cost ($/kWhr, 2001)	0.06	Estimated by Black & Veatch
Heavy-frame turbine efficiency loss due to control system pressure drop in turbine (%/in H_2O)	0.15	Cost-Effectiveness, pages 21-22
Catalyst Life Guarantee (years)	3	Estimated by Black & Veatch
Sales Tax (%)	3	CCM, Page 2-21

Dry Low NOx Burners

Dry low-NO_x (DLN) burners mix a lean air-to-fuel mixture prior to entering the gas turbine burner rather than within the burner. This minimizes fuel-rich areas in the burner, thus reducing high temperature "hot-spots", which reduces NO_x emissions. DLN burners have been demonstrated to reduce NO_x emissions to less than 15 ppmv.

Flue Gas Recirculation

Flue gas recirculation (FGR) involves recirculating a portion of the flue gas back to the primary combustion zone as a replacement for the combustion air. The flue gas provides inert gases that lower the flame temperature thus reducing NO_x. NO_x emissions can be reduced to approximately 15 ppmv.

Catalytic Combustion (XONON)

Catalytic combustion control technology utilizes a catalyst bed within the combustor to oxidize a lean air-to-fuel mixture instead of the combustion with a flame. The combustion process is a partial combustion of fuel in the catalyst followed by complete combustion downstream of the catalyst. Catalytica Energy Systems, Inc. manufactures the XONON catalytic combustion control technology. This control system enables a lower combustion temperature, which in turn lowers NO_x emissions. XONON has been shown to reduce NO_x emission to 3.5 to 6 ppmv from small turbines (1.5 MW).

Flue-Gas NO_x Controls

NO_x flue-gas post-combustion control techniques reduce NO_x emissions by using chemical reactions with various techniques after the combustor and prior to stack exit.

Selective Catalytic Reduction (SCR)

SCR systems reduce NO_x by ammonia injection upstream of a catalyst material, such as vanadium/titanium. The ammonia reacts with oxygen and NO_x on the catalyst to form nitrogen and water, thus NO_x is removed from the flue gas. Any un-reacted ammonia exits the stack and is known as ammonia slip. This technology can reduce NO_x emissions by up to 96%, but has a high initial cost. Also, the catalyst has a finite lifetime which can be limited by excessive temperatures or chemical contamination from sulfur, sodium, and calcium, among others. SCR systems have operated, depending upon the catalyst material, from 550 to 1,100 °F. The desired level of NO_x reduction can be achieved by varying the catalyst volume and/or the amount of injected ammonia.

Selective Non-Catalytic Reduction (SNCR)

SNCR systems reduce NO_x emissions by injecting a reagent into the flue-gas stream. The reagents used are ammonia and urea and the control technologies go by the trade names Thermal DeNO$_x$ and NOXOUT. No catalyst is required for NO_x reduction. This technology is based on high temperature ionization of the ammonia or urea instead of a catalytic method like SCR. The nominal operating temperature of SNCR systems is 1,600 to 2,000 °F.

SCONOx

Goal Line Environmental Technologies has developed a catalyst system to remove both NO_x and CO. The technology has been licensed by ABB/Alstom for commercial development. In the SCONOX system the NO_x is absorbed onto a platinum-based catalytic surface that uses a potassium carbonate (K_2CO_3) coating. The NO reacts with the catalytic surface and O_2 to form NO_2. The NO_2 reacts with the K_2CO_3 to form CO_2 and potassium nitrates (KNO_2 and KNO_3), thereby reducing the overall NO_x from the flue-gas. The entire system is most efficient when air seals around doors and dampers do not leak.

$SCONO_x$ has been utilized with success for an extended period on a 32 MW turbine. The technology, however, has not been utilized on any large (greater than 100 MW) turbines. The $SCONO_x$ catalyst is subject to the same degradation as the catalysts for SCR. The $SCONO_x$ system utilizes dampers and gas seals to regulate the NO_x reduction and regenerate the catalyst. The dampers and seals must cycle every 10 to 15 minutes. According to Goal Line's information for the existing 32 MW facility, this involves 8 mechanical dampers cycling approximately 4 times per hour or 32 damper movements per hour. At five times the scale, the La Paz Generating Facility would require a damper movement every 10 seconds. Considering the thermal fluctuations that would occur during these mechanical movements, a certain amount of thermal warp and in-duct malfunctions can be expected to occur, which would result in lower performance over time. Hydrogen is utilized as a reducing agent in the absence of O_2 for regenerating the catalyst. A portion of the $SCONO_x$ catalyst needs to be removed and "washed" at least once a year, which increases downtime for the facility.

Technically Infeasible NO_x Control Technologies

The SNCR was eliminated as technically infeasible and therefore not used further for BACT. SNCR requires the flue-gas to be 1,600 to 2,000 °F. The proposed turbine exhaust temperatures will be approximately 650 °F.

Top-Down Analysis

The "top-down" listing of NO_x control technologies for the CTG/HRSG units at the La Paz Generating Facility is presented in Table B-1.2. During this phase of the analysis, the control technology that emits the least is listed as BACT.

Control Technology Evaluation

The control technology evaluation is performed on each control technology with respect to energy, environmental and economic impacts.

TABLE B-1.2
TOP-DOWN LIST OF NO_X CONTROL TECHNOLOGIES FOR THE CTG/HRSG UNITS

Facility	Location	Permit Date	Throughput (MW)	Emission (ppm @ 15%)	Type of Control
Nueva Azalea Power Plant Project [a]	So. Gate, LA County, CA	8/9/00	550 with un-fired HRSG	1	Dry Low-NOx Burners with SCONO$_x$
Otay Mesa Power Plant[b]	Otay Mesa, San Diego County, CA	9/18/00	510 with un-fired HRSG	2	SCONO$_x$
Multiple	Multiple	-	Various with duct fired HRSG	2.5 or Greater	Dry Low-NOx Burners and Ammonia Injection SCR
Pastoria Energy Facility LLC	Tejon Ranch, So. Kern County, CA	5/15/00	750 with un-fired HRSG	2.5	Dry Low-NOx Burners and Ammonia Injection SCR OR XONON (if XONON not available)
Multiple	Multiple	-	Various	3.0	Steam Injection SCR
Alabama Power Co.	McIntosh, AL	4/24/98	100	15	Dry Low NO_x Burners
Yuma Cogeneration Assoc.	Yuma, AZ	5/25/99	55	25	Massive Steam Injection

[a] The California Energy Commission, in order for facility relocation, has placed The Nueva Azalea Power Plant Project on a 6-month suspension as of March 12, 2001.
[b] The Otay Mesa Power Plant has an option to use either SCONO$_x$ or SCR.

Energy Impacts for NO_x BACT

The following are energy impacts due to the various control technologies:

- SCR adds approximately 2 to 3 inches H_2O backpressure to the CTG, increasing fuel consumption to overcome;

- SCR requires vaporizers and blowers to vaporize and dilute the ammonia for injection increasing fuel consumption;
- $SCONO_x$ adds 4 to 5 inches H_2O backpressure to the CTG ; and
- $SCONO_x$ requires hydrogen, steam and natural gas to regenerate the system.

Energy costs associated with the energy impacts are assessed below.

Environmental Impacts for NO_x BACT

The usage of ammonia in SCR control technologies has a definite environmental impact as ammonia is listed as a hazardous substance under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and Section 112r of the Accidental Release Provisions. Also, ammonia slip is unavoidable according to *Alternative Control Techniques Document—NO_x Emissions from Stationary Gas Turbines EPA-453/R-93-007, January 1993.* A properly designed SCR system should limit ammonia slip to less than 10 ppm. The Arizona Ambient Air Quality Guideline (AAAQG) concentrations for ammonia are a 1-hour average of 230 $\mu g/m^3$ and a 24-hour average of 140 $\mu g/m^3$. Furthermore, environmental impacts from SCR systems are ammonium salts that will be emitted to the atmosphere as PM_{10} and the spent catalyst will need to be disposed of properly.

Economic Impacts for NO_x BACT

A summary of costs and emission reductions for NO_x emission controls is presented in Table B-1.3. The costs are based on the control technology necessary to obtain 2.5 ppmvd NO_x @ 15% O_2 output while operating 8,760 hours per year with duct firing from one turbine. The budgetary costs associated with the SCR and $SCONO_x$ systems were developed by Black and Veatch based on preliminary equipment quotations provided by Engelhard Corporation and ABB Alston Power (Appendix A).

The NO_x emission rate from the CTG with DLN burners prior to entering the NO_x control system is 815.2 tpy. With stack emissions at 2.0 ppmvd (66.2 tpy), the NO_x emission reduction from $SCONO_x$ is 748.8 tpy. With stack emissions at 2.5 ppmvd (82.69 tpy), the NO_x emission reduction from SCR is 732.3 tpy. In order to obtain a NO_x output concentration of 2.5 ppmvd o, either DLN burners with $SCONO_x$ or DLN burners with SCR are acceptable technological choices.

The budgetary costs associated with the installation of $SCONO_x$ include the installation cost of $11,867,260 and the annualized cost of $5,095,300. For SCR , the installation cost is $3,608,487 and the annualized cost is $2,030,972. The $SCONO_x$ control system is nearly 3 times as expensive to install as SCR . The Total Cost Effectiveness of $SCONO_x$ on an annualized $/ton of NO_x emission reduction basis is over twice as expensive to operate than the SCR control system. The $SCONO_x$ control system is prohibitively more expensive than the SCR system to purchase and to operate. The installation and annual operational costs of $SCONO_x$ to control NO_x from the CTG/HRSG units is considered excessive and therefore eliminated from BACT consideration.

TABLE B-1.3 SUMMARY OF COSTS AND EMISSION REDUCTIONS FOR NO_X EMISSION CONTROLS		
Category	**$SCONO_x$**	**SCR -**
Total installation costs ($)	11,867,260	3,608,487
Total annualized costs ($)	5,095,300	2,030,972
NO_x emissions reduction (tpy)	748.8	732.51
Total annualized cost effectiveness NO_x ($/ton)	6,805	2,773

NO_x BACT Determination

The current permitted BACT for the majority of CTG/HRSG units with duct burners is DLN burners and SCR with ammonia injection, which controls emitted NO_x to 2.5 ppmvd or greater. XONON, while an effective emerging technology, has no large turbine operational time. XONON will most likely provide the same level of NO_x reduction as the more technologically proven SCR. $SCONO_x$ has a 0.5 ppmvd NO_x reduction improvement over SCR. This improvement is very small compared to the overall 3 times capital and 2 times annual expense that $SCONO_x$ demands. Furthermore, use of these emerging control technologies is limited to California or non-attainment areas. The California definition of BACT is equivalent to the federal EPA designation of Lowest Achievable Emission Reduction (LAER). The lowest NO_x BACT limit found in recent non-emerging control technologies not in California was 2.5 ppmvd @15% O_2.

For the La Paz Generating Facility, Allegheny proposes utilizing DLN burners with SCR and ammonia injection as BACT for the CTG/HRSG units, which is estimated to provide an output of 2.5 ppmvd. This combination of technologies provides the level of control for NO_x emissions required to meet or exceed all but the more costly and emerging technologies available. Ammonia slip emissions will not exceed 10 ppmvd.

CO BACT Analysis

This section describes the CO BACT for large CTG/HRSG systems.

CO Control Alternatives

The latest EPA-RBLC, CARB BACT, recent Arizona and vendor supplied CO BACT findings for gas turbines are presented in Appendix C. Identification of the various CO control technologies applicable to large combined cycle turbines includes the following:

Combustor CO Controls

Good Engineering Design and Operation

Good engineering design and operation control techniques that reduce the concentrations of CO emissions in the gas turbine flue include: (a) increasing the temperature or quantity of oxygen during fuel combustion, (b) varying the residence time at flame temperature, (c) combustion zone design and (d) fuel/air turbulence in the combustor. Up to 50% CO control efficiency can be realized with these techniques.

Catalytic Combustion (XONON)

Catalytic combustion control technology utilizes a catalyst bed within the combustor to oxidize a lean air-to-fuel mixture instead of the combustion with a flame. The combustion process involves a partial combustion of fuel in the catalyst followed by complete combustion downstream of the catalyst. Catalytica Energy Systems, Inc. manufactures the XONON catalytic combustion control technology. This control system is primarily intended for the control of NOx formation. The system, however, also controls the emissions of CO because the system uses catalytic combustion rather than flame combustion thus reducing CO. XONON has been shown to reduce CO emissions to 6 ppmv from small turbines (1.5 MW).

Flue-Gas CO Controls

Oxidation Catalyst

The oxidation catalyst control technology utilizes residual oxygen present in the CTG exhaust gas stream to convert CO to CO_2. The catalyst accelerates the rate of oxidation by adsorbing O_2 from the air stream and CO in the waste stream onto the catalyst surface to react to form CO_2 and H_2O. The CO catalytic oxidation reactors operate in a narrow temperature range of 700 to 1,100 °F. At lower temperatures, the catalytic conversion efficiency reduces rapidly while higher temperatures may result in catalyst damage. Typical control efficiencies from an oxidation catalyst are from 80-90% resulting in CO output concentrations of approximately 6 ppmvd at 15% O_2.

SCONOx

Goal Line Environmental Technologies has developed a single catalyst system to remove both NOx and CO. The CO is catalytically oxidized to CO_2 and the NO_x is converted to NO_2, which is then absorbed onto the catalyst. The entire system is most efficient when air seals around doors and dampers do not leak. $SCONO_x$ has been utilized on a 32 MW turbine for an extended period with success, however, the technology has not been utilized on a large (greater than 100 MW) turbine. The SCONOx catalyst is subject to the same degradation as the oxidation catalysts. The SCONOx system utilizes dampers and gas seals to regulate the CO reduction and regenerate the catalyst. The dampers and seals must cycle every 10 to 15 minutes. According to Goal Line's information for the existing 32 MW facility, this involves 8 mechanical dampers cycling approximately 4 times per hour or 32 damper movements per hour. At five times the scale, the La Paz Generating Facility would require a damper movement every 10 seconds. Considering the thermal fluctuations that would occur during these mechanical movements, a certain amount of thermal warp and in-duct malfunctions can be expected to occur, resulting in decreased performance over time. Hydrogen is utilized as a reducing agent in the absence of O_2 for regenerating the catalyst. A portion of the $SCONO_x$ catalyst needs to be removed and "washed" at least once a year, which increases downtime for the facility.

Technically Infeasible CO Control Technologies

No CO control technology was eliminated due to technical infeasibility.

Top-Down Analysis

The "top-down" listing of CO control technologies for the CTG/HRSG units at the La Paz Generating Facility is presented in Table B-1.4. During this phase of the analysis, the control technology that emits the least is listed as BACT.

Control Technology Evaluation

The control technology evaluation is performed on each control technology with respect to energy, environmental and economic impacts.

Energy Impacts for CO BACT

Energy impacts due to the various control technologies involve the following concerns:

- Catalytic oxidation adds approximately 0.8 inch H_2O backpressure to the CTG, increasing fuel consumption to overcome.
- $SCONO_x$ adds 4 to 5 inches H_2O backpressure to the CTG.
- $SCONO_x$ requires steam, hydrogen and natural gas regenerate the system.

Environmental Impacts for CO BACT

In addition to oxidizing CO, oxidation catalyst can oxidize other elements and compounds as well. For example, slip ammonia present in the catalytic oxidizer may combine with oxidized gaseous SO_2 (SO_3) to form ammonium bisulfate or ammonium sulfite, which may increase PM_{10} emissions.

TABLE B-1.4
TOP-DOWN LIST OF CO CONTROL TECHNOLOGIES FOR THE CTG/HRSG UNITS

Facility	Location	Permit Date	Throughput (MW)	Emission (ppm @ 15%)	Type of Control
Nueva Azalea Power Plant Project [a]	So. Gate, LA County, CA	8/9/00	550 with un-fired HRSG	0.5	$SCONO_x$
Multiple	Multiple	-	Various with duct fired HRSG	Greater than 2	Oxidation Catalyst with Good Combustion Design and Operation
Pastoria Energy Facility LLC	Tejon Ranch, So. Kern County	2/12/01	750 with un-fired HRSG	6	Oxidation Catalyst with Good Combustion Design and Operation OR XONON (if XONON not available)
Otay Mesa Power Plant	Otay Mesa, San Diego County, CA	9/18/00	510 combined cycle	6 at >73% load and 10 at 73% load	$SCONO_x$
Duke Energy Moss Landing Power Plant Project	Moss Landing, Monterey County, CA	10/25/00	1,206 Combined cycle	9.0	Good Engineering Design and Operation

[a] The Ca. Energy Commission in order for facility relocation has placed The Nueva Azalea Power Plant Project on a 6-month suspension as of March 12, 2001.

Economic Impacts for CO BACT

The budgetary costs associated with the $SCONO_x$ system is provided by Engelhard Corporation and ABB Alstom Power in Appendix A. A summary of costs is presented in Table B-1.5. The costs are based on the control technology necessary to obtain 5.0 ppmvd CO @ 15% O_2 output while operating 8,760 hours per year with duct firing from one turbine.

TABLE B-1.5
SUMMARY OF COSTS AND EMISSION REDUCTIONS FOR CO EMISSION CONTROLS

Category	$SCONO_x$	Catalytic Oxidation
Total installation costs ($)	11,867,260	1,974,376
Total annualized costs ($)	5,095,300	746,735
CO emissions reduction (tpy)	429	368
Total annualized cost effectiveness CO ($/ton)	11,877	2,029

For the La Paz Generating Facility, Engelhard Corporation and ABB Alstom Power have estimated that with the current CTG/HRSG duct-fired system, the $SCONO_x$ system will both provide CO emission reduction to 2.0 ppmvd @ 15% O_2 (40 tpy). The catalytic oxidizer system will provide CO emission reduction to 5.0 ppmvd @ 15% O_2 (101 tpy). The CO concentration from the CTG with DLN prior to entering either control system is 469 tpy. At 2.0 ppmvd, the CO emission reduction from the $SCONO_x$ system is 429 tpy. For the catalytic oxidizer system, the CO emission reduction is 368 tpy.

In order to obtain a CO output concentration of 5.0 ppmvd or less for the La Paz Generating Facility, either $SCONO_x$ or oxidation catalyst, both coupled with good engineering practices are acceptable technological choices. The budgetary costs associated with the installation of $SCONO_x$ include the installation cost of $11,867,260 and the annualized cost of $5,095,300. For the oxidation catalyst control system, the installation cost is $1,974,376 and the annualized cost is $746,735. The $SCONO_x$ control system is over 6 times as expensive as the oxidation catalyst control system to install. The Total Cost Effectiveness of $SCONO_x$ on an annualized $/ton of NO_x emission reduction basis is over 5¾ times as expensive to operate than the oxidation catalyst control system. The $SCONO_x$ control system is prohibitively more expensive to purchase and operate than the oxidation catalyst control system. The installation and annual operational costs of $SCONO_x$ to control CO from the CTGs is excessive and therefore eliminated from BACT consideration.

CO BACT Determination

The current permitted CO BACT for the majority of CTG/HRSG systems with duct burners is catalytic oxidation, which has the ability to control emitted CO from 2 ppmvd to 6 ppmvd. XONON, while an effective emerging technology, has no large turbine operational time. Furthermore, XONON will provide the same level of CO reduction as the much more technologically proven oxidation catalyst system. $SCONO_x$ could have a level of CO reduction improvement over catalytic oxidation, however, this increase in reduction is very small compared to the expense that $SCONO_x$ demands. Furthermore, use of these emerging control technologies is usually limited to California and/or non-attainment areas. The California definition of BACT is generally equivalent to the federal EPA designation of LAER. For the La Paz Generating Facility, Allegheny proposes utilizing catalytic oxidation with good engineering practices as BACT for the CTG/HRSG units with duct burners in order to obtain a CO output of 5 ppmvd. This technology provides the level of control for CO emissions required to meet or exceed all but the more costly and unproven emerging technologies available.

PM_{10} BACT Analysis

This section describes the PM_{10} BACT for large CTG/HRSG systems. PM_{10} is typically found in fuels with high ash or sulfur content such as coal, not in clean burning fuels like natural gas. Gas turbines are typically run with excess air that reduces PM_{10} even further (also reduces CO).

PM_{10} Control Alternatives

The latest EPA-RBLC, CARB BACT, recent Arizona and vendor supplied PM_{10} BACT findings for gas turbines are presented in Appendix D. PM_{10} emissions from gas-fired turbines are minimal. Typically PM_{10} add-on control devices are not installed on gas turbines due to the relatively high cost per lb of PM_{10} reduction. Identification of the various PM_{10} control technologies applicable to large combined cycle turbines includes the following:

Good Engineering Design and Operation

Combustion control techniques that reduce the concentrations of PM_{10} emissions in the gas turbine flue gas include: (a) increasing the temperature or quantity of oxygen during fuel combustion, (b) varying the residence time at flame temperature, (c) combustion zone design and (d) fuel/air turbulence in the combustor. By minimizing NO_x and unburned hydrocarbons, PM_{10} emissions will be reduced.

Low Natural Gas Sulfur

Natural gas suppliers have the ability to deliver natural gas that contains a specific content of sulfur. By minimizing the amount of sulfur in the fuel, PM_{10} emissions can be reduced.

Electrostatic Precipitators

An electrostatic precipitator (ESP) is a particle control device that uses electrical forces to gather the particles out of the CTG and HRSG exhaust stream and onto collector plates. The particles are given an electrical charge by forcing them to pass through a corona, a region in which gaseous ions flow. The electrical field that forces the charged particles to the walls comes from electrodes maintained at high voltage in the center of the flow lane. Once the particles are collected on the plates, they are removed from the plates by knocking them loose from the plates, allowing the collected layer of particles to slide down into a hopper from which they are evacuated.

Fabric Filters (Baghouse)

In a fabric filter, flue gas is passed through a tightly woven or felted fabric, causing PM in the flue gas to be collected on the fabric by sieving and other mechanisms. Fabric filters are usually in the shape of bags, with a number of the individual fabric filter units housed together in a group (baghouse). The dust cake that forms on the filter from the collected PM can significantly increase collection efficiency. Practical application of fabric filters requires the use of a large fabric area in order to avoid an unacceptable pressure drop across the fabric.

Scrubbers

Scrubbers include a group of pollution control devices (packed bed, venturi, plate/tray, spray chamber, bed scrubber, etc.). All scrubbers utilize a scrubbing liquid (water) over various mediums to attract and reduce PM_{10} from the exhaust stream.

Technically Infeasible PM_{10} Control Technologies

Electrostatic precipitators, fabric filters and scrubbers were technically eliminated from BACT consideration due to the low concentrations of PM_{10} in the CTG/HRSG exhaust. In general, the post combustion control system control efficiencies decrease as the PM_{10} concentrations decrease. Since natural gas fired turbines normally emit very low concentrations of PM_{10}, the post combustion control system will provide very low PM_{10} control efficiencies. As a result, no add-on control technology BACT clearinghouse data exists for natural gas fired turbine systems.

Top-Down Analysis

The "top-down" listing of PM_{10} control technologies for the CTG/HRSG units at the La Paz Generating Facility are presented in Table B-1.6. During this phase of the analysis, the control technology that emits the least is listed as BACT.

Control Technology Evaluation

The control technology evaluation is performed on each control technology with respect to energy, environmental and economic impacts. The control technologies to reduce PM_{10} do not require energy, environmental or economic evaluations.

TABLE B-1.6
TOP-DOWN LIST OF PM_{10} CONTROL TECHNOLOGIES FOR THE CTG/HRSG UNITS

Facility	Location	Permit Date	Throughput (MW)	Emission (lb/MMBtu)	Type of Control
Metcalf Energy Center	Southern Edge of San Jose, CA	10/10/00	600 with duct fired HRSG	0.00452 [a] 0.00565 [b]	Natural Gas Firing Assuming 0.2 gr-S/scf or less
Pinnacle West Energy, Redhawk Project	Wintersburg, AZ	10/18/00	2120, 8 turbines with duct fired HRSG	0.0073	Natural Gas Firing and Good Combustion Controls
Los Medanos Energy Center	Pittsburg, Contra Costa County, CA	96/10/99	520 with duct fired HRSG	0.00845	Natural Gas Firing Assuming 1 gr-S/scf or less
Panda Gila River Project	Gila Bend, AZ	2/9/01	2080, 8 turbines with duct fired HRSG	0.0095	Natural Gas Firing and Good Combustion Controls

[a] when duct burners not fired
[b] when duct burners are fired

PM_{10} BACT Determination

The current permitted PM_{10} BACT for the majority of CTG/HRSG units with duct burners is the reduction of sulfur in the fuel coupled with good turbine design and operations. Natural gas suppliers have the ability to specify the fuel sulfur content for the pipeline natural gas. Pipeline quality natural gas generally comes with less than 1 gr-S/100scf. The PM_{10} BACT proposed for the La Paz Generating Facility has two parts: 1) the sulfur content in the natural gas will be equal to or less than 0.75 gr-S/100scf and 2) the CTG/HRSG units and duct burners will be designed and operated according to good

turbine design and operations. For the La Paz Generating Facility, PM_{10} emissions from the CTG/HRSG units will be no greater than 0.0158 lbs/MMBtu.

SO_2 BACT Analysis

This section describes the SO_2 BACT for large CTG/HRSG systems. SO_2 is typically found in fuels with high sulfur content such as coal, not in clean burning fuels like natural gas.

SO_2 Control Alternatives

The latest EPA-RBLC, CARB BACT, recent Arizona and vendor supplied SO_2 BACT findings for gas turbines are presented in Appendix D. SO_2 emissions from gas turbines are minimal. Typically, SO_2 control devices are not installed on gas turbines due to the relatively high cost per lb of SO_2 reduction. Identification of the various SO_2 control technologies applicable to large combined cycle turbines includes the following:

Low Natural Gas Sulfur

Natural gas suppliers have the ability to deliver natural gas that contains a specific content of sulfur. By minimizing the amount of sulfur in the fuel, SO_2 emissions can be reduced.

Flue Gas Desulfurization

Flue gas desulfurization (FGD) technology employs a sorbent, usually lime or limestone, in a water stream to remove SO_2 from the exhaust gas. This produces various calcium compounds and may result in the coincidental manufacture of metal compounds.

Technically Infeasible SO_2 Control Technologies

FGD is technically eliminated from BACT consideration due to the low concentrations of SO_2 in the CTG/HRSG exhaust. In general, the FGD system control efficiencies decrease as the SO_2 concentrations decrease. Since natural gas fired turbines emit very low concentrations of SO_2, FGD units would provide very low control efficiencies. As a result, no add-on control technology BACT clearinghouse data exists for natural gas fired turbine systems.

Top-Down Analysis

The "top-down" listing of SO_2 control technologies for the CTG/HRSG unit at La Paz Generating Facility is presented in Table B-1.7. During this phase of the analysis, the control technology that emits the least is listed as BACT.

Control Technology Evaluation

The control technology evaluation is performed on each control technology with respect to energy, environmental and economic impacts. The control technologies to reduce SO_2 do not require energy, environmental or economic evaluations.

TABLE B-1.7 TOP-DOWN LIST OF SO_2 CONTROL TECHNOLOGIES FOR CTG/HRSG UNITS					
Facility	**Location**	**Permit Date**	**Throughput (MW)**	**Emission (lb/MMBtu)**	**Type of Control**
Metcalf Energy Center	Southern Edge of San Jose, CA	10/10/00	600 with duct fired HRSG	0.0006	Natural Gas Firing Assuming 0.2 gr-S/scf or less
Morro Bay Power Plant	Morro Bay, San Luis Obispo County, CA	10/23/00	600, 2 turbines with duct fired HRSG	0.0007	Natural Gas Firing Assuming 0.25 gr-S/scf or less
Panda Gila River Project	Gila Bend, AZ	2/9/01	2080 with duct fired HRSG	0.002	Low Sulfur Natural Gas
Los Medanos Energy Center	Pittsburg, Contra Costa County, CA	96/10/99	520 with duct fired HRSG	0.00277	Natural Gas Firing Assuming 1.0 gr-S/scf or less

SO_2 BACT Determination

The current permitted SO_2 BACT for the majority of CTG/HRSG units with duct burners is the reduction of sulfur in the fuel. Natural gas suppliers have the ability to specify the fuel sulfur content for the pipeline natural gas. Pipeline quality natural gas generally comes with less than 1 gr-S/100scf. The SO_2 BACT for the La Paz Generating Facility is the sulfur content in the natural gas must be equal to or less than 0.75 gr-S/100scf. For the La Paz Generating Facility, the proposed SO_2 emission rate for each CTG/HRSG unit with duct firing is 0.0024 lbs/MMBtu.

VOC BACT Analysis

This section describes the VOC BACT for large CTG/HRSG systems. VOCs are typically found in emissions resulting from incomplete combustion in the CTGs or duct burners.

VOC Control Alternatives

The latest EPA-RBLC, CARB BACT, recent Arizona and vendor supplied VOC BACT findings for gas turbines is presented in Appendix D. VOC emissions from gas turbines are generally minimal. Typically, VOC control devices are not installed on gas turbines due to the relatively high cost per lb of VOC reduction. Identification of the various VOC control technologies applicable to large combined cycle turbines with duct firing includes the following:

Good Engineering Design and Operation

Combustion control techniques that reduce the concentrations of VOC emissions in the gas turbine flue gas include: (a) increasing the temperature or amount of time for the combustion of gases in the combustor, (b) combustion zone design and (c) fuel/air turbulence in the combustor.

Oxidation Catalyst

The oxidation catalyst control technology utilizes excess air present in the CTG exhaust gas stream to oxidize the VOCs. The catalyst accelerates the rate of oxidation by adsorbing O_2 from the air stream

and VOCs in the waste stream onto the catalyst surface to react to form CO_2 and H_2O. The VOCs catalytic oxidation reactors operate in a narrow temperature range of 700 to 1,100 °F. At lower temperatures, the catalytic conversion efficiency reduces rapidly, while higher temperatures may result in catalyst damage. The VOC control efficiencies from an oxidation catalyst are dependant on the speciation of the VOCs in the exhaust stream. Some species such as formaldehyde can have removal efficiencies as high as 85 to 90 percent, while other species are removed at much lower efficiencies. Total VOC removal efficiencies are typically in the 30 to 50 percent range.

SCONOx

Goal Line Environmental Technologies has developed a catalyst system to remove NOx, CO and VOCs. The VOCs are catalytically oxidized to H_2O and CO_2. The entire system is most efficient when air seals around doors and dampers do not leak. $SCONO_x$ has been utilized on a 32 MW turbine for an extended period with success; however, the technology has not been used on a large (greater than 100 MW) turbine for an extended period of time. The $SCONO_x$ catalyst is subject to the same degradation as the oxidation catalysts. The $SCONO_x$ system utilizes dampers and gas seals to regulate the VOC reduction and regenerate the catalyst. The dampers and seals must cycle every 10 to 15 minutes. According to Goal Line's information for the existing 32 MW facility, this involves 8 mechanical dampers cycling approximately 4 times per hour or 32 damper movements per hour. At 5 times the scale, the La Paz Generating Facility would require a damper movement every 10 seconds. Considering the thermal fluctuations that would occur during these mechanical movements, a certain amount of thermal warp and in-duct malfunctions may occur. Hydrogen is utilized as a reducing agent in the absence of O_2 for regenerating the catalyst. A portion of the $SCONO_x$ catalysts needs to be "washed" at least once a year, which increases downtime for the facility.

Technically Infeasible VOC Control Technologies

No VOC control technology listed was eliminated due to technical infeasibility.

Top-Down Analysis

The "top-down" listing of VOC control technologies for the CTG/HRSG units at the La Paz Generating Facility are presented in Table B-1.8. During this phase of the analysis, the control technology that emits the least is listed as BACT.

TABLE B-1.8
TOP-DOWN LIST OF VOC CONTROL TECHNOLOGIES FOR THE CTG//HRSG UNITS

Facility	Location	Permit Date	Throughput (MW)	Emission (ppm @ 15%)	Type of Control
Nueva Azalea Power Plant Project	So. Gate, LA County, CA	8/9/00	550 with un-fired HRSG	1.2	$SCONO_x$
Otay Mesa Power Plant	Otay Mesa, San Diego County, CA	9/18/00	510 combined cycle	90% reduction efficiency	$SCONO_x$
Multiple	Multiple	-	Various with duct fired HRSG	1-6	Oxidation Catalyst
Pastoria Energy Facility LLC	Tejon Ranch, So. Kern County, CA	5/15/00	750 with un-fired HRSG	2.0	Oxidation Catalyst or XONON

TABLE B-1.8 TOP-DOWN LIST OF VOC CONTROL TECHNOLOGIES FOR THE CTG//HRSG UNITS					
Facility	**Location**	**Permit Date**	**Throughput (MW)**	**Emission (ppm @ 15%)**	**Type of Control**
Duke Energy Moss Landing Power Plant Project	Moss Landing, Monterey County, CA	10/25/00	1,206 Combined cycle	9.0	Good Engineering Design and Operation

Control Technology Evaluation

The control technology evaluation is performed on each control technology with respect to energy, environmental and economic impacts.

Energy Impacts for VOC BACT

Energy impacts due to the various control technologies involve the following concerns:

- Catalytic oxidation adds approximately 0.8 inch H_2O backpressure to the CTG, increasing fuel consumption to overcome.
- $SCONO_x$ adds 4 to 5 inches H_2O backpressure to the CTG.
- $SCONO_x$ requires hydrogen, steam and natural gas to regenerate the system.

Environmental Impacts for VOC BACT

In addition to oxidizing VOC, oxidation catalyst can oxidize other elements and compounds as well. For example, slip ammonia present in the catalytic oxidizer may combine with oxidized gaseous SO_2 (SO_3) to form ammonium bisulfate or ammonium sulfite, which may increase PM_{10} emissions.

Economic Impacts for VOC BACT

The budgetary costs associated with the $SCONO_x$ system is provided by Engelhard Corporation and ABB Alston Power (Appendix A). A summary of costs and emission related information is presented in Table B-1.9. The budgetary costs associated with the installation of $SCONO_x$ include the installation cost of $11,867,260 and the annualized costs of $5,095,300. For the oxidation catalyst control system, the installation cost is $1,974,376 and the annualized cost is $746,735. The $SCONO_x$ control system is over 2½ times as expensive as the oxidation catalyst control system to install. The Total Cost Effectiveness of $SCONO_x$ on an annualized $/ton of VOC emission reduction basis is over 6¾ times as expensive to operate than the oxidation catalyst control system. The $SCONO_x$ control system is prohibitively more expensive to purchase and operate than the oxidation catalyst control system. The installation and annual operational costs of $SCONO_x$ to control VOCs from the CTGs is excessive and therefore eliminated from BACT consideration.

TABLE B-1.9 SUMMARY OF COSTS AND EMISSION REDUCTIONS FOR VOC EMISSION CONTROLS		
Category	**SCONO$_x$**	**Oxidation Catalyst**
Total installation costs ($)	11,867,260	1,974,376
Total annualized costs ($)	5,095,300	746,735
VOC reduction efficiency (%)	80	30
Uncontrolled VOC emissions (tpy)	48.31	48.31
Controlled VOC emissions (tpy)	33.8	33.8
Controlled VOC emissions reduction (tpy)	14.5	14.5
Total annualized cost effectiveness VOC ($/ton)	351,400	51,499

VOC BACT Determination

The current permitted VOC BACT for the majority of CTG/HRSG units with duct burners is oxidation catalyst, which controls emitted VOC from 1 to 6 ppmvd. SCONO$_x$ has the potential to have an equal or slightly better amount of VOC reduction, however, this increase in reduction is very small compared to the overall expense that SCONO$_x$ demands. For the La Paz Generating Facility, Allegheny proposes utilizing oxidation catalyst as VOC BACT for the CTG/HRSG units with duct burners in order to obtain a VOC output of 2.9 ppmvd.

Cooling Tower BACT

Cooling towers are designed to reduce the temperature of the steam turbine operating water. Only particulate matter is emitted in non-negligible amounts from cooling towers. This section describes the PM_{10} BACT for the cooling towers.

PM_{10} Control Alternatives for Cooling Towers

The latest EPA-RBLC, CARB BACT, recent Arizona and vendor supplied PM_{10} BACT findings for cooling towers are presented in Appendix F. Identification of the various PM_{10} control technologies applicable to large combined cycle turbines includes the following:

Water Cooled Cooling Towers – Good Design

The magnitude of drift loss may be minimized by the design and operation of the cooling tower. The number and magnitude of drift is influenced the physical design, the air and water patterns, maintenance, and operation levels such as water flow. Water-cooled cooling towers utilize water evaporation to absorb heat, which effectively causes the steam turbine water to cool. PM_{10} that is emitted from the cooling is generated by the presence of total dissolved solids (TSD) in the cooling tower circulation water. To improve the evaporation rate and increase cooling, cooling towers are designed to induce fresh air across a large surface containing the cooling tower water. The induced air entrains some water out of the tower. This is referred to as drift. As the drift evaporates in the ambient air, PM_{10} is released. Further, as the water is evaporated from the tower, the TDS concentration increases.

Water Cooled Cooling Towers with Drift Eliminators

Drift eliminators use inertial separation caused by direction changes while passing through the eliminators to coalesce and collect fine water droplets thus reducing drift. Since there is no reference method available to adequately measure PM_{10} emissions from a cooling tower, the TSD in a volume of cooling water is monitored to avoid excessive PM_{10}. EPA's compilation of emission factors (AP-42) gives a value for the amount of drift from water-cooled induced (forced) draft towers at 0.020% of circulating water flow.

Dry Cooling

Dry cooling is most frequently accomplished by the use of an air-cooled condenser (ACC), which represents the most competitive dry cooling technology available for this application. Auxiliary heat load from plant equipment is rejected to the atmosphere through an air-cooled heat exchanger (ACHX). The total ACC and ACHX plan area requirement is significantly greater than the plan area required with a cooling tower type system.

The heat transfer modules of an ACC are in the form of A-frame structures where the sides of the A-frame consist of finned tube bundles and the bottom of the A-frame consists of a fan. A single ACC for a large steam condensing application consists of several such modules arranged in rows with four or five modules per row. The modules are elevated well above grade level to attain uniform airflow entering the fan of each module.

The fan on the bottom of the A-frame forces air upward through the finned tube bundles that form the sides of the A-frame structure. The steam from the low pressure steam turbine exhaust is ducted to the ACC and flows through the inside of the finned tubes. As air flows over the fins on the tube outer surface, heat is transferred from the steam flow inside the tubes to the air. As heat is transferred to the air, the air temperature increases and the steam inside the tubes is condensed. Condensed steam drains to a collection tank where it is pumped back through the steam cycle.

A typical air cooled condenser has a design initial temperature difference (ITD) of 50 °F. The ITD is the difference between the temperature of the air flow entering the ACC and the steam saturation temperature within the tubes. The ITD can be reduced, however, the cost increases in an exponential fashion with decreasing ITD. ACC's with ITD's less than around 45 °F are very rare for high condenser heat load applications such as the steam cycle heat rejection duty for this project.

Technically Infeasible PM_{10} Control Technologies

Dry cooling as a PM_{10} control technology is deemed technical infeasibility. The use of dry cooling equipment to reject steam cycle waste heat to the atmosphere would have a very significant negative impact on plant operation and cost. Plant output, heat rejection equipment costs, and parasitic power consumption for a dry cooling system are significantly inferior when compared to an evaporative cooling system such as a cooling tower type system. The difference is most significant during periods of high ambient temperature.

With an ITD of 45 °F on a 115 °F day, the corresponding steam turbine backpressure is 9.68 inches HgA. This is greater than the maximum exhaust pressure a KN steam is capable of operating. This operation would require a special design steam turbine suited to operation at these conditions. Therefore, dry cooling is not a feasible option for this facility without greatly reducing plant load during periods of high ambient temperature. Since power demand is also greatest during periods of high ambient temperature, this is not a recommended method of rejecting steam cycle heat.

Top-Down Analysis

The "top-down" listing of PM_{10} control technologies for the cooling towers at the La Paz Generating Facility is presented in Table B-1.10. During this phase of the analysis, the control technology that is the most effective at reducing emissions is listed as BACT.

TABLE B-1.10
TOP-DOWN LIST OF PM_{10} CONTROL TECHNOLOGIES FOR COOLING TOWERS

Facility	Location	Permit Date	Throughput (gal/min)	Emission (% of flow)	Type of Control
Otay Mesa (510MW total)	San Diego Co.	9/18/00	600 MMBtu/hr	Negligible	Air-Cooled Condenser
Multiple	Multiple		Greater than 10,000	0.005 (or greater)	Drift Eliminator
Occidental Chemical Corporation	Hahnville, LA	3/19/01	8,000	Not Indicated	Good Design, No Additional Control

Control Technology Evaluation

The control technology evaluation is performed on each control technology with respect to energy, environmental and economic impacts.

Energy Impacts for PM_{10} BACT

There are no energy impacts due to the various control technologies for the cooling towers.

Environmental Impacts for PM_{10} BACT

Allegheny intends on using reclaimed water from the water-cooled condensers to recharge the local aquifer.

Economic Impacts for PM_{10} BACT

There are no economic impacts to discuss for this BACT.

Cooling Tower PM_{10} BACT Determination

The current permitted PM_{10} BACT for the majority of cooling towers is drift eliminator control technology with a drift rate of 0.0005% of the water circulating in the tower. For the La Paz Generating Facility, Allegheny proposes utilizing 2 water-cooled condenser towers with a drift rate of 0.0005% of water circulating in the towers as BACT in order to obtain a PM_{10} output of 14.85 tpy for each of the two cooling towers.

Auxiliary Boiler BACT

The auxiliary boiler provides supplementary heating of the HRSG unit. This keeps components of the HRSG hot, resulting in quick turbine starting and minimizing emissions. Emissions from the boiler include NO_x, CO, SO_2, PM_{10}, and VOCs. The auxiliary boilers are not normally operated during CTG operation. The auxiliary boilers are fired by natural gas (0.75 gr-S/100 scf) with a fuel burn rate of

55.34 MMBtu/hr. Although the boilers are to be used less than 2,000 hours per year, the annual emissions are based on continuous (8,760 hours/yr) operation.

NO_x BACT Analysis

This section describes the NO_x BACT for the auxiliary boiler for the La Paz Generating Facility.

NO_x Control Alternatives for Boilers

The RBLC Clearinghouse findings for boilers with a heat input less than 100 MMBtu/hr is presented in Appendix G. The EPA's RBLC determination for boilers less than 100 MMBtu/hr have emission rates of 30 ppmvd at 3% O_2 utilizing good combustion practices with DLN burners. The California RBLC Clearinghouse findings indicated a majority of NO_x emissions from 5 to 40 ppmv using DLN burners with FGR or SCR. Refer to the NO_x BACT analysis for the CTG/HRSG units above for a discussion on emission control descriptions.

Technically Infeasible NO_x Control Technologies

To operate effectively, SCR and SNCR control systems require boiler exhaust temperatures from 700 to 900 °F and 1,600 to 2,000 °F, respectively. The flue gas temperature from the auxiliary boilers will be approximately 350 °F. To increase the exhaust temperature by 350° or more would substantially increase NO_x emissions. Therefore, SCR and SNCR control systems are considered to be technically infeasible for the auxiliary boiler.

Top-Down Analysis

The "top-down" listing of NO_x control technologies for the auxiliary boilers at the La Paz Generating Facility is presented in Table B-1.11. During this phase of the analysis, the control technology that is the most effective at reducing emissions is listed as BACT.

Control Technology Evaluation

There was no control technology evaluation performed on the control technologies with respect to energy, environmental and economic impacts for the auxiliary boilers.

Auxiliary Boiler NO_x BACT Determination

The current permitted NO_x BACT for the majority of auxiliary boilers is DLN burner control technology. Allegheny proposes using DLN burners as BACT in order to limit the NO_x emission rate to 0.1 lbs/MMBtu (5.53 lbs/hr), which is typical BACT of other natural gas fired boilers for HRSG units. This will result in an annual emission rate of 24.22 tpy for the auxiliary boiler operating 8,760 hr/yr. The overall expense of adding an add-on control unit to the boiler would result in a very high $/ton of NO_x reduced.

CO BACT Analysis

This section describes the CO BACT for the auxiliary boiler at the La Paz Generating Facility.

CO Control Alternatives for Boilers

Appendix G also presents the RBLC for CO control devices for boilers less than 100 MMBtu/hr. The EPA's RBLC for boilers less than 100 MMBtu/hr list the lowest recent permitted CO emission rates to be 0.05 lb/MMBtu utilizing good combustion practices. Other possible BACTs for the auxiliary boiler include those described in the CO BACT for the CTG/HRSG units.

TABLE B-1.11
TOP-DOWN LIST OF NO_x CONTROL TECHNOLOGIES FOR THE AUXILIARY BOILER

Facility	Location	Permit Date	Throughput (MMBtu/hr)	Emission (lbs/MMBtu)	Type of Control
Exxon Co., Santa Ynez Project	CA	2/5/96	95	0.033	Dry Low NOx Burners with FGR and Steam Injection
Griffith Energy	Near Kingman, AZ	8/31/99	38	0.092	Low NOx Burners with Flue Gas Recirculation and Natural Gas Only
Arlington Valley Energy (Duke Energy)	Arlington, AZ	10/18/00	29.3	0.106	Natural Gas DLN with Flue Gas Recirculation
Yuma Cogeneration Associates	Yuma, AZ	5/25/99	20	0.140	Natural Gas Only

Technically Infeasible CO Control Technologies

To operate effectively, oxidation catalysts require boiler exhaust temperatures from 700 to 900 °F. The flue gas temperature from the auxiliary boilers will be approximately 350 °F. To increase the exhaust temperature by 350 °F, would substantially increase NO_x emissions. Therefore, oxidation catalysts are considered to be technically infeasible for the auxiliary boilers.

Top-Down Analysis

During this phase of the analysis, the control technology that is the most effective at reducing emissions is listed as BACT. Good combustion techniques control technology is considered BACT.

Control Technology Evaluation

There was no control technology evaluation performed on the control technologies with respect to energy, environmental and economic impacts.

Auxiliary Boiler CO BACT Determination

The current permitted CO BACT for the majority of auxiliary boilers is good combustion techniques. Allegheny proposes using good combustion techniques in order to limit the CO emission rate of the auxiliary boiler to 0.06 lb/MMBtu (3.32 lbs/hr). This will result in annual CO emission rate of 14.54 tpy for the auxiliary boiler operating 8,760 hr/yr.

PM_{10} BACT Analysis

This section describes the PM_{10} BACT for the auxiliary boiler at the La Paz Generating Facility.

PM_{10} Control Alternatives for Boilers

Appendix G also presents the RBLC for PM10 control devices for boilers less than 100 MMBtu/hr. The EPA's RBLC for boilers less than 100 MMBtu/hr list the lowest recent permitted PM10 emission rates to be 0.005 lb/MMBtu utilizing good combustion practices either separately or coupled with a natural gas specification of low sulfur.

Technically Infeasible PM_{10} Control Technologies

No PM_{10} control technology listed was eliminated due to technical infeasibility.

Top-Down Analysis

During this phase of the analysis, the control technology that is the most effective at reducing PM_{10} emissions is listed as BACT. Good combustion techniques coupled with a combustion of natural gas with a sulfur content of 0.75 gr-S/100 SCF control technology is considered BACT.

Control Technology Evaluation

There was no control technology evaluation performed on the control technologies with respect to energy, environmental and economic impacts.

Auxiliary Boiler PM_{10} BACT Determination

The current permitted PM_{10} BACT for the majority of auxiliary boilers is good combustion techniques with or without a sulfur content of less than 1%-S/100scf in natural gas. Allegheny has proposed using good combustion techniques and low sulfur content in natural gas in order to limit the PM_{10} emission rate to 0.01 lb/MMBtu (0.55 lbs/hr). This will result in annual PM_{10} emission rate of 2.41 tpy for each auxiliary boiler operating 8,760 hr/yr.

SO_2 BACT Analysis

This section describes the SO_2 BACT for the auxiliary boiler at the La Paz Generating Facility.

SO_2 Control Alternatives for Boilers

Appendix G also presents the RBLC for SO_2 control devices for boilers less than 100 MMBtu/hr. The EPA's RBLC for boilers less than 100 MMBtu/hr lists the lowest recent permitted SO_2 emission rates to be 0.003 lb/MMBtu utilizing natural gas with a low specification of sulfur.

Technically Infeasible SO_2 Control Technologies

No SO_2 control technology listed was eliminated due to technical infeasibility.

Top-Down Analysis

During this phase of the analysis, the control technology that is the most effective at reducing SO_2 emissions is listed as BACT. Good combustion techniques coupled with a combustion of natural gas with a sulfur content of 0.75 gr-S/100scf control technology is considered BACT.

Control Technology Evaluation

There was no control technology evaluation performed on the control technologies with respect to energy, environmental and economic impacts.

Auxiliary Boiler SO_2 BACT Determination

The current permitted SO_2 BACT for the majority of auxiliary boilers is good combustion techniques with or without a sulfur content of less than 1 gr-S/100scf in natural gas. Allegheny proposes using good combustion techniques and low sulfur content in natural gas in order to limit the SO_2 emission rate to 0.0025 lb/MMBtu (0.14 lbs/hr). This will result in annual SO_2 emission rate of 0.61 tpy for the auxiliary boiler operating 8,760 hr/yr.

VOC BACT Analysis

This section describes the VOC BACT for the auxiliary boiler at the La Paz Generating Facility.

VOC Control Alternatives for Boilers

Appendix G also presents the RBLC for VOC control devices for boilers less than 100 MMBtu/hr. The EPA's RBLC for boilers less than 100 MMBtu/hr lists the lowest recent permitted VOC emission rates to be 0.005 lb/MMBtu utilizing good combustion practices. Other possible BACTs for the auxiliary boiler include VOC BACT in the section for CTGs and duct fired HRSGs.

Technically Infeasible VOC Control Technologies

To operate effectively, oxidation catalysts require boiler exhaust temperatures from 700 to 900 °F. The flue gas temperature from the auxiliary boiler will be approximately 350 °F. To increase the exhaust temperature by 350 °F, would substantially increase NO_x emissions. Therefore, oxidation catalysts are considered to be technically infeasible for the auxiliary boilers.

Top-Down Analysis

During this phase of the analysis, the control technology that is the most effective at reducing VOC emissions is listed as BACT. Good combustion techniques coupled with a combustion of natural gas with a sulfur content of 0.75 gr S/100scf control technology is considered BACT.

Control Technology Evaluation

There was no control technology evaluation performed on the control technologies with respect to energy, environmental and economic impacts.

Auxiliary Boiler VOC BACT Determination

The current permitted VOC BACT for the majority of auxiliary boilers is good combustion techniques with or without a sulfur content of less than 1 gr S/100scf in natural gas. Allegheny proposes using good combustion techniques and low sulfur content in natural gas in order to limit the VOC emission rate to 0.015 lb/MMBtu (0.83 lbs/hr). This will result in annual VOC emission rate of 3.64 tpy for the auxiliary boiler operating 8,760 hr/yr.

Emergency Diesel Generator and Fire Pump BACT

The 1,000 kW emergency diesel engine generators will provide on demand electrical power for the facility in the event of a power grid failure. The 254 bhp emergency diesel fired engines will drive the emergency firewater pumps. All will be used less than 500 hrs/yr. Pollutants from the emergency generators include NO_x, CO, SO_2, PM_{10}, and VOCs. For the purposes of the Emissions Inventory presented below, the emergency fire pumps were considered insignificant activity as defined in R18-2-101.54. Their emissions will be much lower than the emergency generators.

The BACT analysis for the emergency diesel engines are the same as for the CTGs and duct fired HRSGs. The emission rates for the emergency generators are extremely low (maximum annual NO_x emissions of 3.3 tpy). Even with greater than 95% emission reduction, only 3.1 tpy would be captured. To utilize any add-on combustion technology (such as SCR or catalytic combustion), the $/ton removed would be extremely expensive. Therefore, all add-on control technologies are deemed economically infeasible. Alternatively, the use of low sulfur diesel fuel coupled with good combustion practices is proposed as BACT for the emergency and fire pump diesel engines. The sulfur content in the diesel fuel will be at most 0.05% by weight sulfur.

EMISSIONS INVENTORY

This section presents the emissions inventory for the La Paz Generating Facility. The inventory is based upon the current available design data and the BACT analysis presented above. The La Paz Generating Facility will be a new major source and subject to Title 18, Chapter 2 of the AAC. The inventory presented in this document (revised to reflect final design and corresponding final BACT) will be submitted as part of a Class I Air Quality Permit Application to the Arizona Department of Environmental Quality (ADEQ).

Process and Product Descriptions

The La Paz Generating Facility will be a baseload, natural gas-fired, combined cycle electric generation facility with two power blocks, each rated at 540 MW for a maximum facility rating of 1,080 MW at design ambient conditions. A process flow diagram of the La Paz Generating Facility is presented on Figure B-1.2.

The only product produced by the La Paz Generating Facility will be electricity produced from the CTGs and STGs.

Emission Related Information

This section presents a summary of the planned emission units for the La Paz Generating Facility and the potential to emit (PTE) of regulated pollutants from each unit. The facility will emit nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter less than 10 microns nominal aerodynamic diameter (PM_{10}), volatile organic compounds (VOCs), hazardous air pollutants (HAPs), and Arizona Ambient Air Quality Guideline (AAAQG) pollutants. Detailed vendor information used to calculate emissions is provided in Appendix H.

Combined-Cycle Gas Turbine Criteria Pollutant Emissions

A worst-case CTG/HRSG emissions scenario was determined by evaluating emissions under various loads and temperatures. The load conditions included 100%, 85% and 70%, and were evaluated under

ambient temperatures of 20°F, 72°F and 115°F. The evaluations also considered conditions with and without duct firing for the 100% load condition.

The maximum hourly criteria pollutant emission rates for the four CTG/HRSG units based on proposed BACT limits and various load and ambient temperature conditions are listed in Table B-1.12. The annual PTE emissions, based on 100% load and 72°F average annual ambient temperature conditions, are presented in Table B-1.13.

Cooling Tower PM_{10} Emissions

The primary pollutant from the two cooling towers will be PM_{10}. The cooling towers will emit negligible amounts of other pollutants. The maximum hourly and annual PM_{10} emission rates for the cooling towers are presented in Table B-1.14.

Auxiliary Boiler and Emergency Generator Criteria Pollutant Emissions

The maximum hourly and annual criteria pollutant emission rates for the auxiliary boiler and two emergency generators are listed in Table B-1.15. (The emergency fire pumps are considered an insignificant activity as defined in R18-2-101.54). The auxiliary boiler will fire natural gas only and will only be used during periods of turbine shutdown. Although the boiler is estimated to be used fewer than 2,000 hours per year, the annual emissions are based on continuous (8760 hours/yr) operation. The emergency diesel generators will operate less than 500 hours per year.

Startup Criteria Pollutant Emissions

Startups are classified as hot, warm and cold based on the duration of the proceeding shut-down period. Startup emission rates may exceed normal operation emission rates because the control equipment has not reached operating temperatures. This is especially true for CO and NO_x. PM_{10} and SO_2 emissions are generally lower than emissions at base load because emissions of these pollutants are dependent upon fuel consumption rates which are lower under startup conditions. Consequently, the calculation of startup emissions was limited to CO, NO_x, and VOCs.

Based on vendor data provided in Appendix H, the hourly and annual startup emissions per CTG are listed in Table B-1.16. These data represent controlled emissions between two turbines under simultaneous startup operations. The annual emissions are based upon 50 hot, 50 warm and 50 cold startups per turbine per year.

Shutdown emissions are not included in the inventory because these rates are less than the rates at full operation. Thus, by using full operation emission rates during periods of shutdown, the inventory is more conservative as compared to a more realistic evaluation with shutdowns and downtimes included.

Facility PTE

A summary of the La Paz Generating Facility hourly and annual PTE from all sources is presented in Table B-1.17. The annual values include startup emissions for CO, NO_x and VOCs. The values in Table B-1.17 are based on the operating conditions and emission factors described in Tables B-1.11 to B-1.16 and the vendor data provided in Appendix H.

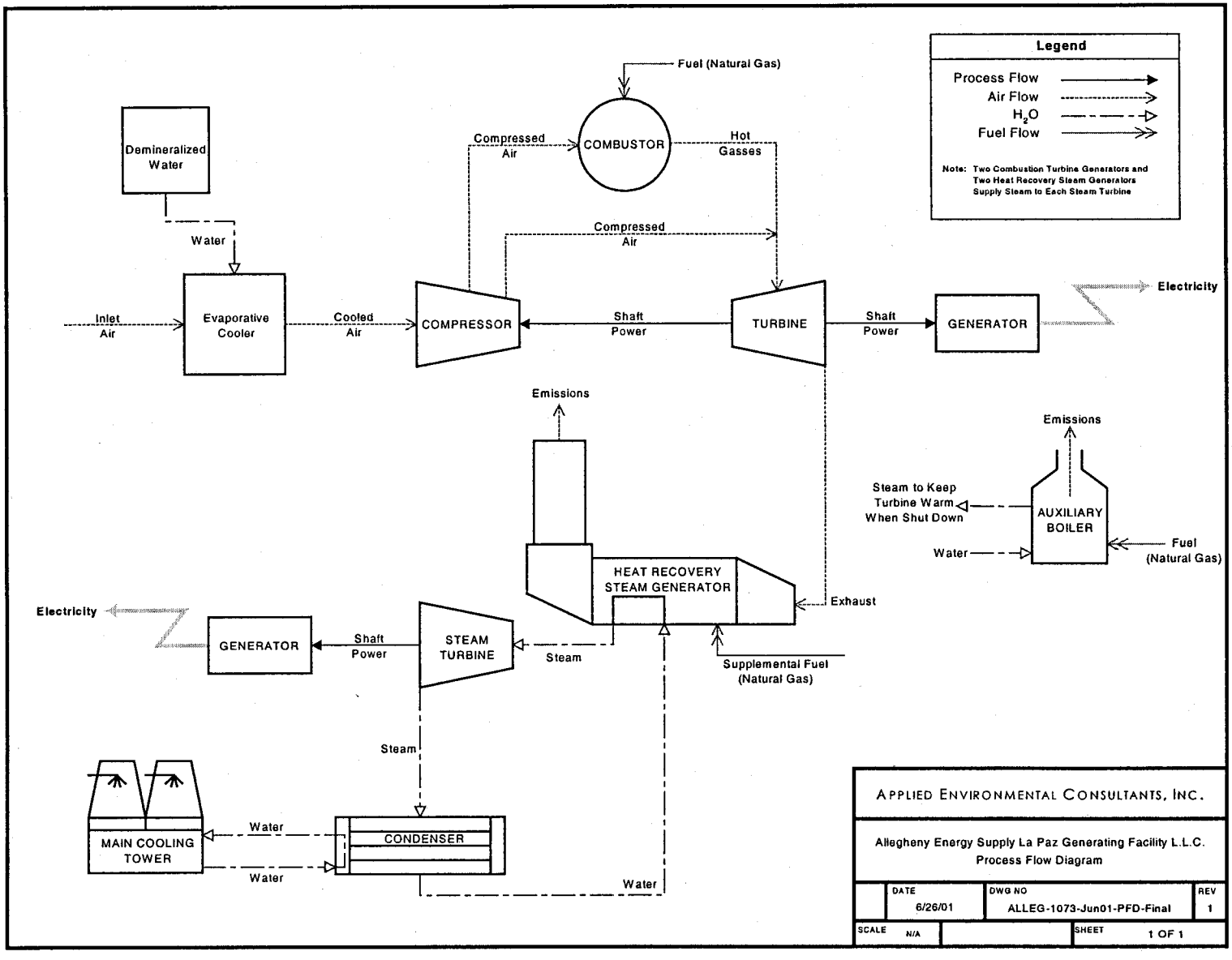


Figure B-1.2. Process flow diagram of the La Paz Generating Facility.

TABLE B-1.12
MAXIMUM HOURLY CRITERIA POLLUTANT CONTROLLED EMISSION RATES (LB/HR) FOR EACH CTG/HRSG UNIT UNDER VARIOUS LOADS AND AMBIENT TEMPERATURES

Temperature (°F)		115°					72°					20°				
% Load	Duct Firing (DF)	NO_x	CO	SO_2	PM_{10}	VOC	NO_x	CO	SO_2	PM_{10}	VOC	NO_x	CO	SO_2	PM_{10}	VOC
100	Without DF	15.63	19.03	3.69	23.30	3.05	16.46	20.04	3.89	23.60	3.21	17.90	21.81	4.23	24.10	3.50
	With DF	18.18	22.14	4.00	28.70	**7.83**	18.88	22.99	4.46	28.70	7.72	**20.08**	**24.47**	**4.74**	**28.70**	7.57
85	Without DF	12.37	15.06	3.00	22.20	2.78	13.91	16.95	3.29	22.80	3.12	15.50	18.86	3.66	23.30	3.48
70	Without DF	10.86	13.22	2.57	21.70	2.44	12.07	14.70	2.85	22.10	2.71	13.34	16.23	3.15	22.60	3.00

Emissions are for each CTG/HRSG stack.
Bold values represent worst case emission rates and thus the hourly PTE for each CTG/HRSG unit.
NO_x emissions based on 2.5 ppmvd @ 15% O_2 with Selective Catalytic Reduction (SCR).
CO emissions based on 5 ppmvd @ 15% O_2 with oxidation catalyst.
SO_2 emissions based on 0.42 ppmvd @ 15% O_2 with scrubber (with no SO_2 oxidation) and natural gas sulfur content of 0.75 grains/100 scf.
VOC emissions based on 1.40 to 3.09 ppmvd @ 15% O_2 with catalyst, expressed as CH_4.
PM_{10} emissions based on front and back half catch and include effect of SO_2 oxidation and SCR catalysts.
See detailed vendor calculations in Appendix H.

TABLE B-1.13 ANNUAL CRITERIA POLLUTANT CONTROLLED EMISSION RATES (TONS/YR) FOR EACH CTG/HRSG UNIT						
Source ID	**Description**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**VOC**
CTGSTK1	CTG/HRSG Emissions From Stack 1	82.7	100.7	19.5	125.7	33.8
CTGSTK2	CTG/HRSG Emissions From Stack 2	82.7	100.7	19.5	125.7	33.8
CTGSTK3	CTG/HRSG Emissions From Stack 3	82.7	100.7	19.5	125.7	33.8
CTGSTK4	CTG/HRSG Emissions From Stack 4	82.7	100.7	19.5	125.7	33.8
	Totals:	330.8	402.8	78.0	502.8	135.2
Emission rates based on maximum hourly rates for 100% load, with duct firing, at an ambient temperature of 72°F (see Table B-1.11), for 8,760 hours.						

TABLE B-1.14 MAXIMUM HOURLY AND ANNUAL COOLING TOWER PM_{10} EMISSION RATES			
Source ID	**Description**	**Maximum Hourly PM_{10} Emissions (lb/hr)**	**Annual PM_{10} Emissions (tons/yr)**
COOLT1	Cooling Tower One	3.39	14.8
COOLT2	Cooling Tower Two	3.39	14.8
	Totals:	6.78	29.7
Annual emission rates based on maximum hourly rate times 8,760 hours. These values represent the hourly and annual PTE of each emission unit. Emissions based on design flow rate of 152,550 gal/min and drift rate of 0.0005% - See Appendix H.			

Hazardous Air Pollutant Emissions

Hourly and annual HAP and Arizona Ambient Air Quality Guideline (AAAQG) pollutant emission rates for all emission sources at the La Paz Generating Facility, are presented in Tables B-1.18 and B-1.19. Detailed calculation worksheets, based on vendor data and published emission factors, are presented in Appendix B. The published emission factors are from AP-42 and the California Air Toxics Emission Factors (CATEF) database. For each pollutant with an emissions factor listed in both AP-42 and CATEF, the highest emission factor was used except as noted in the worksheets in Appendix H.

AIR IMPACT ANALYSIS

This section presents an ambient air impact analysis of emissions from the La Paz Generating Facility. The analysis is based on the emissions inventory for the La Paz Generating Facility provided above and follows the methodology outlined in the protocol document: *PSD Modeling Protocol to Assess Ambient Air Quality Impacts from the Allegheny La Paz Generating Facility*, April 25, 2001, which was submitted to ADEQ.

The La Paz Generating Facility will be a new major source and subject to Prevention of Significant Deterioration (PSD) requirements. The objective of the dispersion modeling was to quantify the maximum predicted ambient impacts due to emissions from the facility for comparison with applicable (a) National Ambient Air Quality Standards (NAAQS), (b) PSD increments, and (c)

TABLE B-1.15
MAXIMUM HOURLY AND ANNUAL CRITERIA POLLUTANT AUXILIARY BOILER AND EMERGENCY GENERATOR EMISSION RATES

		Maximum Hourly Emissions (lb/hr)					Annual Emissions (tons/yr)				
Source ID	**Description**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**VOC**	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**VOC**
AUXB	Auxiliary Boiler	5.53	3.32	0.14	0.55	0.83	24.2	14.5	0.6	2.4	3.6
EMERG1	Emergency Generator One	13.25	3.66	5.20	0.94	0.35	3.3	0.9	1.3	0.2	0.1
EMERG2	Emergency Generator Two	13.25	3.66	5.20	0.94	0.35	3.3	0.9	1.3	0.2	0.1
	Totals:	32.03	10.64	10.54	2.43	1.53	30.8	16.3	3.2	2.8	3.8

Annual auxiliary boiler emission rates based on maximum hourly rate times 8,760 hours.
Annual emergency generator emission rates based on maximum hourly rate times 500 hours.
Emergency generators rated at 1000 KW.
All values calculated using emissions data provided by vendor – see Appendix H.

TABLE B-1.16
HOURLY AND ANNUAL CONTROLLED STARTUP EMISSION RATES

		Nox			CO			VOC		
Type	Duration (min)	Total Emissions (lbs) per Startup (2 CTGs)	Average Hourly Emissions per Startup per CTG (lbs/hour)	Average Annual Emissions per CTG (tons/year)	Total Emissions (lbs) per Startup (2 CTGs)	Average Hourly Emissions per Startup per CTG (lbs/hour)	Average Annual Emissions per CTG (tons/year)	Total Emissions (lbs) per Startup (2 CTGs)	Average Hourly Emissions per Startup per CTG (lbs/hour)	Average Annual Emissions per CTG (tons/year)
Hot	116	136	35.2	1.7	781	202.0	9.8	121	31.3	1.5
Warm	185	328	53.2	4.1	2268	367.8	28.4	286	46.4	3.6
Cold	284	901	95.2	11.3	6628	700.1	82.9	963	101.7	12.0
		Annual Total/CTG:		17.1	Annual Total/CTG:		121.1	Annual Total/CTG:		17.1

Annual emissions based on 50 hot, 50 warm and 50 cold starts per year.
These values are based on vendor data for startups that take into account post-combustion effects with duct burners from the SCR and CO catalyst systems.

TABLE B-1.17
SUMMARY OF LA PAZ GENERATING FACILITY HOURLY AND ANNUAL POTENTIAL TO EMIT CRITERIA POLLUTANTS

Source ID	Description	Maximum Hourly Emissions (lb/hr)					Annual Emissions (tons/yr)				
		NO_x	CO	SO_2	PM_{10}	VOC	NO_x [a]	CO [a]	SO_2 [b]	PM_{10} [b]	VOC [a]
CTGSTK1	CTG/HRSG Stack 1	20.08	24.47	4.74	28.70	7.83	95.2	216.2	19.5	125.7	49.0
CTGSTK2	CTG/HRSG Stack 2	20.08	24.47	4.74	28.70	7.83	95.2	216.2	19.5	125.7	49.0
CTGSTK3	CTG/HRSG Stack 3	20.08	24.47	4.74	28.70	7.83	95.2	216.2	19.5	125.7	49.0
CTGSTK4	CTG/HRSG Stack 4	20.08	24.47	4.74	28.70	7.83	95.2	216.2	19.5	125.7	49.0
COOLT1	Cooling Tower One	--	--	--	3.39	--	--	--	--	14.8	--
COOLT2	Cooling Tower Two	--	--	--	3.39	--	--	--	--	14.8	--
AUXB	Auxiliary Boiler	5.53	3.32	0.14	0.55	0.83	24.2	14.5	0.6	2.4	5.7
EMERG1	Emergency Gen. One	13.25	3.66	5.20	0.94	0.35	3.3	0.9	1.3	0.2	0.1
EMERG2	Emergency Gen. Two	13.25	3.66	5.20	0.94	0.35	3.3	0.9	1.3	0.2	0.1
	Totals:	112.35	108.52	29.5	124.01	32.85	411.6	881.1	81.2	535.2	201.9

[a] Annual emission rates for NOx, CO and VOC based on controlled hourly rates for 100% load, with duct firing, at an ambient temperature of 72°F (see Table B-1.11), for 8,272 hours (8,760 - 488 hours for startups). Totals include controlled startup emissions based on 50 hot, 50 warm and 50 cold starts per year (see Table B-1.15).

[b] Annual emission rates for SO_2 and PM_{10} based on controlled hourly rates for 100% load, with duct firing, at an ambient temperature of 72°F (see Tables B-1.11 and B-1.12), for 8,760 hours. Startup emissions for SO_2 and PM_{10} are not included because full load emission rates are worst case.

TABLE B-1.18
HOURLY HAP AND AAAQG EMISSIONS FOR THE CTG/HRSTG UNITS, AUXILIARY BOILER AND EMERGENCY GENERATORS

Air Pollutants		Hourly Emissions (lb/hr)							
Name	Class*	CTG/HRSG1	CTG/HRSG2	CTG/HRSG3	CTG/HRSG4	AUXB	EMERGE	EMERGW	TOTAL
1,3-Butadiene	HAP	9.61E-04	9.61E-04	9.61E-04	9.61E-04	-	-	-	3.84E-03
2-Chloronaphthalene	POM	5.96E-07	5.96E-07	5.96E-07	5.96E-07	-	-	-	2.38E-06
2-Methylnaphthalene	POM	1.16E-05	1.16E-05	1.16E-05	1.16E-05	1.30E-06	-	-	4.76E-05
3-Methylchloranthrene	POM	3.94E-06	3.94E-06	3.94E-06	3.94E-06	9.77E-08	-	-	1.59E-05
7,12-Dimethylbenz(a)anthracene	POM	3.50E-05	3.50E-05	3.50E-05	3.50E-05	8.68E-07	-	-	1.41E-04
Acenaphthene	POM	4.16E-05	4.16E-05	4.16E-05	4.16E-05	9.77E-08	4.69E-05	4.69E-05	2.60E-04
Acenaphthylene	POM	3.22E-05	3.22E-05	3.22E-05	3.22E-05	9.77E-08	9.26E-05	9.26E-05	3.14E-04
Acetaldehyde	HAP	-	-	-	-	7.98E-04	2.53E-04	2.53E-04	1.30E-03
Acetaldehyde	HAP	5.36E-03	5.36E-03	5.36E-03	5.36E-03	-	-	-	2.14E-02
Acrolein	HAP	1.43E-02	1.43E-02	1.43E-02	1.43E-02	-	7.90E-05	7.90E-05	5.73E-02
Ammonia	AAAQG	2.80E+01	2.80E+01	2.80E+01	2.80E+01	-	-	-	1.12E+02
Anthracene	POM	7.40E-05	7.40E-05	7.40E-05	7.40E-05	1.30E-07	1.23E-05	1.23E-05	3.21E-04
Benzene	HAP	2.68E-02	2.68E-02	2.68E-02	2.68E-02	1.14E-04	7.78E-03	7.78E-03	1.23E-01
Benzo(a)anthracene	POM	4.95E-05	4.95E-05	4.95E-05	4.95E-05	-	6.24E-06	6.24E-06	2.10E-04
Benzo(a)pyrene	POM	3.04E-05	3.04E-05	3.04E-05	3.04E-05	6.51E-08	2.58E-06	2.58E-06	1.27E-04
Benzo(b)fluoranthene	POM	2.47E-05	2.47E-05	2.47E-05	2.47E-05	9.77E-08	1.11E-05	1.11E-05	1.21E-04
Benzo(e)pyrene	POM	1.19E-06	1.19E-06	1.19E-06	1.19E-06	-	-	-	4.77E-06
Benzo(g,h,i)perylene	POM	3.00E-05	3.00E-05	3.00E-05	3.00E-05	6.51E-08	-	-	1.20E-04
Benzo(g,h,l)perylene	POM	-	-	-	-	-	5.58E-06	5.58E-06	1.12E-05
Benzo(k)fluoranthene	POM	2.41E-05	2.41E-05	2.41E-05	2.41E-05	9.77E-08	2.19E-06	2.19E-06	1.01E-04
Chrysene	POM	5.52E-05	5.52E-05	5.52E-05	5.52E-05	9.77E-08	1.53E-05	1.53E-05	2.52E-04
Dibenz(a,h)anthracene	POM	5.15E-05	5.15E-05	5.15E-05	5.15E-05	6.51E-08	3.47E-06	3.47E-06	2.13E-04
Dichlorobenzene	HAP	2.63E-03	2.63E-03	2.63E-03	2.63E-03	6.51E-05	-	-	1.06E-02
Ethylbenzene	HAP	7.15E-02	7.15E-02	7.15E-02	7.15E-02	-	-	-	2.86E-01
Fluoranthene	POM	9.46E-05	9.46E-05	9.46E-05	9.46E-05	1.63E-07	4.04E-05	4.04E-05	4.59E-04
Fluorene	POM	1.27E-04	1.27E-04	1.27E-04	1.27E-04	1.52E-07	1.28E-04	1.28E-04	7.65E-04
Formaldehyde	HAP	-	-	-	-	4.07E-03	7.91E-04	7.91E-04	5.65E-03
Formaldehyde	HAP	4.47E-02	4.47E-02	4.47E-02	4.47E-02	-	-	-	1.79E-01

TABLE B-1.18
HOURLY HAP AND AAAQG EMISSIONS FOR THE CTG/HRSTG UNITS, AUXILIARY BOILER AND EMERGENCY GENERATORS

Air Pollutants		Hourly Emissions (lb/hr)							
Name	Class*	CTG/HRSG1	CTG/HRSG2	CTG/HRSG3	CTG/HRSG4	AUXB	EMERGE	EMERGW	TOTAL
Hexane	HAP	5.67E-01	5.67E-01	5.67E-01	5.67E-01	9.77E-02	-	-	2.37E+00
Indeno(1,2,3-cd)pyrene	POM	5.15E-05	5.15E-05	5.15E-05	5.15E-05	9.77E-08	4.15E-06	4.15E-06	2.14E-04
Naphthalene	HAP	2.90E-03	2.90E-03	2.90E-03	2.90E-03	3.31E-05	1.30E-03	1.30E-03	1.43E-02
PAH	SUM	4.91E-03	4.91E-03	4.91E-03	4.91E-03	-	-	-	1.97E-02
Perylene	POM	1.53E-06	1.53E-06	1.53E-06	1.53E-06	-	-	-	6.13E-06
Phenanthrene	POM	6.86E-04	6.86E-04	6.86E-04	6.86E-04	9.22E-07	4.09E-04	4.09E-04	3.56E-03
Propylene Oxide	HAP	6.48E-02	6.48E-02	6.48E-02	6.48E-02	-	-	-	2.59E-01
Pyrene	POM	6.07E-05	6.07E-05	6.07E-05	6.07E-05	2.71E-07	3.72E-05	3.72E-05	3.17E-04
Toluene	HAP	2.90E-01	2.90E-01	2.90E-01	2.90E-01	1.84E-04	2.82E-03	2.82E-03	1.17E+00
Xylene (m,p)	HAP	1.07E-01	1.07E-01	1.07E-01	1.07E-01	-	-	-	4.28E-01
Xylene (o)	HAP	5.26E-02	5.26E-02	5.26E-02	5.26E-02	-	-	-	2.10E-01
Xylene (Total)	SUM	1.43E-01	1.43E-01	1.43E-01	1.43E-01	-	1.94E-03	1.94E-03	5.76E-01
Arsenic	HAP	4.82E-04	4.82E-04	4.82E-04	4.82E-04	1.19E-05	-	-	1.94E-03
Barium	AAAQG	9.64E-03	9.64E-03	9.64E-03	9.64E-03	2.39E-04	-	-	3.88E-02
Beryllium	HAP	2.63E-05	2.63E-05	2.63E-05	2.63E-05	6.51E-07	-	-	1.06E-04
Cadmium	HAP	2.41E-03	2.41E-03	2.41E-03	2.41E-03	5.97E-05	-	-	9.70E-03
Chromium	HAP	3.07E-03	3.07E-03	3.07E-03	3.07E-03	7.60E-05	-	-	1.23E-02
Cobalt	HAP	1.84E-04	1.84E-04	1.84E-04	1.84E-04	4.56E-06	-	-	7.40E-04
Copper	AAAQG	1.86E-03	1.86E-03	1.86E-03	1.86E-03	4.61E-05	-	-	7.49E-03
Manganese	HAP	8.32E-04	8.32E-04	8.32E-04	8.32E-04	2.06E-05	-	-	3.35E-03
Mercury	HAP	5.69E-04	5.69E-04	5.69E-04	5.69E-04	1.41E-05	-	-	2.29E-03
Nickel	HAP	4.60E-03	4.60E-03	4.60E-03	4.60E-03	1.14E-04	-	-	1.85E-02
Selenium	HAP	5.26E-05	5.26E-05	5.26E-05	5.26E-05	1.30E-06	-	-	2.12E-04
Vanadium	AAAQG	5.04E-03	5.04E-03	5.04E-03	5.04E-03	1.25E-04	-	-	2.03E-02
HAP TOTAL		**1.26E+00**	**1.26E+00**	**1.26E+00**	**1.26E+00**	**1.03E-01**	**1.38E-02**	**1.38E-02**	**5.19E+00**
HAP and AAAQG TOTAL		**2.92E+01**	**2.92E+01**	**2.92E+01**	**2.92E+01**	**1.04E-01**	**1.38E-02**	**1.38E-02**	**1.17E+02**

See detailed worksheets in Appendix H for emission factors and calculation assumptions. CTG/HRSG emission calculations based on 6000 hrs/yr of duct firing.

HAP indicates the pollutant is a Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

POM indicates the pollutant is considered Polycyclic Organic Matter and therefore constitutes a HAP.

AAAQG indicates pollutant is not a HAP but an AAAQG pollutant only.

TABLE B-1.19
ANNUAL HAP AND AAAQG EMISSIONS FOR THE CTG/HRSTG UNITS, AUXILIARY BOILER AND EMERGENCY GENERATORS

Air Pollutants		Annual Emissions (tons/year)							
Name	Class*	CTG/HRSG1	CTG/HRSG2	CTG/HRSG3	CTG/HRSG4	AUXB	EMERGE	EMERGW	TOTAL
1,3-Butadiene	HAP	4.04E-03	4.04E-03	4.04E-03	4.04E-03	-	-	-	1.62E-02
2-Chloronaphthalene	POM	2.50E-06	2.50E-06	2.50E-06	2.50E-06	-	-	-	1.00E-05
2-Methylnaphthalene	POM	4.87E-05	4.87E-05	4.87E-05	4.87E-05	5.70E-06	-	-	2.01E-04
3-Methylchloranthrene	POM	1.66E-05	1.66E-05	1.66E-05	1.66E-05	4.28E-07	-	-	6.67E-05
7,12-Dimethylbenz(a)anthracene	POM	1.47E-04	1.47E-04	1.47E-04	1.47E-04	3.80E-06	-	-	5.93E-04
Acenaphthene	POM	1.75E-04	1.75E-04	1.75E-04	1.75E-04	4.28E-07	1.17E-05	1.17E-05	7.24E-04
Acenaphthylene	POM	1.35E-04	1.35E-04	1.35E-04	1.35E-04	4.28E-07	2.31E-05	2.31E-05	5.88E-04
Acetaldehyde	HAP	-	-	-	-	3.49E-03	6.32E-05	6.32E-05	3.62E-03
Acetaldehyde	HAP	2.25E-02	2.25E-02	2.25E-02	2.25E-02	2.10E-04	-	-	9.04E-02
Acrolein	HAP	6.01E-02	6.01E-02	6.01E-02	6.01E-02	-	1.98E-05	1.98E-05	2.40E-01
Ammonia	AAAQG	1.22E+02	1.22E+02	1.22E+02	1.22E+02	-	-	-	4.90E+02
Anthracene	POM	3.11E-04	3.11E-04	3.11E-04	3.11E-04	5.70E-07	3.08E-06	3.08E-06	1.25E-03
Benzene	HAP	1.13E-01	1.13E-01	1.13E-01	1.13E-01	4.99E-04	1.95E-03	1.95E-03	4.55E-01
Benzo(a)anthracene	POM	2.08E-04	2.08E-04	2.08E-04	2.08E-04	-	1.56E-06	1.56E-06	8.35E-04
Benzo(a)pyrene	POM	1.28E-04	1.28E-04	1.28E-04	1.28E-04	2.85E-07	6.44E-07	6.44E-07	5.13E-04
Benzo(b)fluoranthene	POM	1.04E-04	1.04E-04	1.04E-04	1.04E-04	4.28E-07	2.78E-06	2.78E-06	4.22E-04
Benzo(e)pyrene	POM	5.01E-06	5.01E-06	5.01E-06	5.01E-06	-	-	-	2.00E-05
Benzo(g,h,i)perylene	POM	1.26E-04	1.26E-04	1.26E-04	1.26E-04	2.85E-07	-	-	5.05E-04
Benzo(g,h,l)perylene	POM	-	-	-	-	-	1.39E-06	1.39E-06	2.79E-06
Benzo(k)fluoranthene	POM	1.01E-04	1.01E-04	1.01E-04	1.01E-04	4.28E-07	5.47E-07	5.47E-07	4.07E-04
Chrysene	POM	2.32E-04	2.32E-04	2.32E-04	2.32E-04	4.28E-07	3.84E-06	3.84E-06	9.36E-04
Dibenz(a,h)anthracene	POM	2.16E-04	2.16E-04	2.16E-04	2.16E-04	2.85E-07	8.67E-07	8.67E-07	8.67E-04
Dichlorobenzene	HAP	1.10E-02	1.10E-02	1.10E-02	1.10E-02	2.85E-04	-	-	4.45E-02
Ethylbenzene	HAP	3.01E-01	3.01E-01	3.01E-01	3.01E-01	-	-	-	1.20E+00
Fluoranthene	POM	3.98E-04	3.98E-04	3.98E-04	3.98E-04	7.13E-07	1.01E-05	1.01E-05	1.61E-03
Fluorene	POM	5.34E-04	5.34E-04	5.34E-04	5.34E-04	6.65E-07	3.21E-05	3.21E-05	2.20E-03
Formaldehyde	HAP	-	-	-	-	1.78E-02	1.98E-04	1.98E-04	1.82E-02
Formaldehyde	HAP	1.88E-01	1.88E-01	1.88E-01	1.88E-01	-	-	-	7.51E-01
Hexane	HAP	2.38E+00	2.38E+00	2.38E+00	2.38E+00	4.28E-01	-	-	9.97E+00
Indeno(1,2,3-cd)pyrene	POM	2.16E-04	2.16E-04	2.16E-04	2.16E-04	4.28E-07	1.04E-06	1.04E-06	8.68E-04
Naphthalene	HAP	1.22E-02	1.22E-02	1.22E-02	1.22E-02	1.45E-04	3.26E-04	3.26E-04	4.96E-02
PAH	SUM	2.07E-02	2.07E-02	2.07E-02	2.07E-02	-	-	-	8.26E-02
Perylene	POM	6.44E-06	6.44E-06	6.44E-06	6.44E-06	-	-	-	2.58E-05

TABLE B-1.19
ANNUAL HAP AND AAAQG EMISSIONS FOR THE CTG/HRSTG UNITS, AUXILIARY BOILER AND EMERGENCY GENERATORS

Air Pollutants		Annual Emissions (tons/year)							
Name	Class*	CTG/HRSG1	CTG/HRSG2	CTG/HRSG3	CTG/HRSG4	AUXB	EMERGE	EMERGW	TOTAL
Phenanthrene	POM	2.88E-03	2.88E-03	2.88E-03	2.88E-03	4.04E-06	1.02E-04	1.02E-04	1.17E-02
Propylene Oxide	HAP	2.72E-01	2.72E-01	2.72E-01	2.72E-01	-	-	-	1.09E+00
Pyrene	POM	2.55E-04	2.55E-04	2.55E-04	2.55E-04	1.19E-06	9.30E-06	9.30E-06	1.04E-03
Toluene	HAP	1.22E+00	1.22E+00	1.22E+00	1.22E+00	8.08E-04	7.04E-04	7.04E-04	4.89E+00
Xylene (m,p)	HAP	4.50E-01	4.50E-01	4.50E-01	4.50E-01	-	-	-	1.80E+00
Xylene (o)	HAP	2.21E-01	2.21E-01	2.21E-01	2.21E-01	-	-	-	8.84E-01
Xylene (Total)	SUM	6.01E-01	6.01E-01	6.01E-01	6.01E-01	-	4.84E-04	4.84E-04	2.41E+00
Arsenic	HAP	2.03E-03	2.03E-03	2.03E-03	2.03E-03	5.23E-05	-	-	8.15E-03
Barium	AAAQG	4.05E-02	4.05E-02	4.05E-02	4.05E-02	1.05E-03	-	-	1.63E-01
Beryllium	HAP	1.10E-04	1.10E-04	1.10E-04	1.10E-04	2.85E-06	-	-	4.45E-04
Cadmium	HAP	1.01E-02	1.01E-02	1.01E-02	1.01E-02	2.61E-04	-	-	4.08E-02
Chromium	HAP	1.29E-02	1.29E-02	1.29E-02	1.29E-02	3.33E-04	-	-	5.19E-02
Cobalt	HAP	7.73E-04	7.73E-04	7.73E-04	7.73E-04	2.00E-05	-	-	3.11E-03
Copper	AAAQG	7.83E-03	7.83E-03	7.83E-03	7.83E-03	2.02E-04	-	-	3.15E-02
Manganese	HAP	3.50E-03	3.50E-03	3.50E-03	3.50E-03	9.03E-05	-	-	1.41E-02
Mercury	HAP	2.39E-03	2.39E-03	2.39E-03	2.39E-03	6.18E-05	-	-	9.64E-03
Nickel	HAP	1.93E-02	1.93E-02	1.93E-02	1.93E-02	4.99E-04	-	-	7.78E-02
Selenium	HAP	2.21E-04	2.21E-04	2.21E-04	2.21E-04	5.70E-06	-	-	8.90E-04
Vanadium	AAAQG	2.12E-02	2.12E-02	2.12E-02	2.12E-02	5.47E-04	-	-	8.52E-02
HAP TOTAL		**5.32E+00**	**5.32E+00**	**5.32E+00**	**5.32E+00**	**4.52E-01**	**3.46E-03**	**3.46E-03**	**2.17E+01**
HAP and AAAQG TOTAL		**1.28E+02**	**1.28E+02**	**1.28E+02**	**1.28E+02**	**4.54E-01**	**3.46E-03**	**3.46E-03**	**5.12E+02**

See detailed worksheets in Appendix H for emission factors and calculation assumptions. CTG/HRSG emission calculations based on 6000 hrs/yr of duct firing.
HAP indicates the pollutant is a Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.
POM indicates the pollutant is considered Polycyclic Organic Matter and therefore constitutes a HAP.
AAAQG indicates pollutant is not a HAP but an AAAQG pollutant only.

Arizona Ambient Air Quality Guideline (AAAQG) concentrations. The ensuing sections of this document describe the methodology that was used to conduct the modeling and the results.

Regulatory Status

Source Designation

The proposed La Paz Generating Facility will be a categorical source estimated to have the potential to emit NO_x, CO, PM_{10}, and VOCs at rates greater than 100 tons per year, making the facility a new major source subject to PSD regulations. The facility will also emit sulfur dioxide (SO_2) above the Significant Emission Rate of 40 tons per year, thus subjecting the facility to PSD requirements for SO_2. VOC emissions were not included in the analysis for reasons described below.

Area Classifications

The area surrounding the proposed location of the facility is classified as attainment or unclassifiable for all criteria pollutants.

Baseline Dates

Major Source Baseline Date

The major source baseline date is the date after which actual emissions associated with construction (i.e., physical changes or changes in the method of operation) at a major stationary source affect the available PSD increment. The major source baseline dates are January 6, 1975 for PM and SO_2 and February 8, 1988 for NO_2.

Trigger Date

The trigger date is the date after which the minor source baseline date (described below) may be established. The trigger dates are August 7, 1977 for PM and SO_2 and February 8, 1988 for NO_2.

Minor Source Baseline Dates and Baseline Area

The area for which the minor source baseline date is established by a PSD permit application is known as the baseline area. The State of Arizona has been subdivided into intrastate areas and minor source baseline dates have been determined for each area. The La Paz Generating Facility will be located at the far eastern end of the Mohave-Yuma Intrastate Air Quality Control Region (AQCR), adjacent to the Maricopa Intrastate AQCR. According to information provided by ADEQ, the minor source baseline dates for the Mohave-Yuma Intrastate AQCR are July 15, 1998 for PM_{10}, March 15, 1999 for SO_2, and April 10, 1991 for NO_2. The minor source baseline dates for the Maricopa Intrastate AQCR are March 3, 1980 for PM_{10} and SO_2 and January 20, 1993 for NO_2.

Increment Consumption and Expansion

For the PSD increment analysis presented here, the PSD inventory includes emissions from all increment consuming sources located within the significant impact area for the La Paz Generating Facility plus 50 km. A list of these sources was obtained from ADEQ and Maricopa County.

Ambient Data Requirements

Pre-Application Air Quality Monitoring

Based on a pre-application meeting with ADEQ in early 2000, ADEQ determined that pre-application monitoring for PM_{10} would be required. Monitoring for PM_{10} began in July 2000 at a site located approximately 1.6 km northwest of the proposed facility location (refer to Figure B-1.1). A monitoring protocol and quality assurance project plan (QAPP) was submitted to and approved by ADEQ (*Monitoring Protocol and Quality Assurance Project Plan for Conducting Ambient PM_{10} and Meteorological Monitoring for the Proposed Allegheny Power Plant, Harquahala Valley, Arizona,* April 6, 2000). The quarterly reports (to include PM_{10} and meteorological audit data) required by the QAPP have also been submitted to ADEQ. The PM_{10} collected to date are summarized in Appendix J.

Meteorological Monitoring

On-site meteorological monitoring began April 14, 2000 as part of the previously referenced QAPP. The meteorological site is located in the southwest ¼ of Section 1, T2N, R11W. The modeling conducted for this analysis was based on one full year of data (April 15, 2000 to April 14, 2001). A summary of the meteorological data collected is presented in Appendix K.

Background Concentrations

The background concentrations that were used in the NAAQS modeling described below are summarized in Table B-1.20. The 24-hour and annual background concentrations that were used for PM_{10} are based on the data collected as part of the pre-application monitoring described above. From the data collected to date, the maximum 24-hour concentration is 58 $\mu g/m^3$ and the annual concentration is 16 $\mu g/m^3$ (based on three quarterly averages).

The annual background concentration that was used in the NAAQS modeling for NO_2 is based on the 1999 data collected at the ADEQ monitoring site at the Palo Verde Nuclear Generating Station (*Annual Report 2000, Appendix I, Air Quality Report*, Arizona Department of Environmental Quality), which is located approximately 50 km southeast of the La Paz Generating Facility. The annual average NO_2 concentration measured during 1999 was 6 $\mu g/m^3$ (0.003 ppm).

TABLE B-1.20
BACKGROUND CONCENTRATIONS ($\mu G/M^3$) USED IN THE NAAQS MODELING

	Averaging Period				
Pollutant	**Annual**	**24-hour**	**8-hour**	**3-hour**	**1-hour**
SO_2 [a]	4	10	-	31	-
PM_{10} [b]	16	58	-	-	-
NO_x [c]	6	-	-	-	-
CO [d]	-	-	914	-	2,400

[a] Measured at ADEQ Tucson Craycroft monitoring site.
[b] Measured at Allegheny PM_{10} monitoring site.
[c] Measured at Palo Verde Nuclear Generating Station monitoring site.
[d] Measured at ADEQ Casa Grande monitoring site.

According to the ADEQ Annual Report 2000 referenced above, no rural CO monitoring sites exist. Consequently, use of monitoring data obtained from any of the existing CO monitoring sites will be conservative. For the analysis presented herein, CO data from Casa Grande, which is one of the less

urbanized monitoring locations, were used to represent background concentrations. During 1999, the highest 1-hour and 8-hour CO concentrations measured at the Casa Grande site were 2,400 $\mu g/m^3$ and 914 $\mu g/m^3$, respectively.

There are a number of SO_2 monitoring sites located throughout the state according to the ADEQ Annual 2000 Report. Many of these sites, however, are located near power plants or metropolitan areas, while the others are located near smelters. These sites will provide very conservative estimates of background SO_2 concentrations for the proposed site location. Consequently, SO_2 data from the Tucson, Craycroft site, which had the overall lowest measured concentrations during 1999, were used to represent background concentrations. The 3-hour, 24-hour and annual SO_2 concentrations measured at the Tucson, Craycroft site during 1999, were 31 $\mu g/m^3$, 10 $\mu g/m^3$, and 4 $\mu g/m^3$, respectively.

Emissions Inventory

The complete emissions inventory for the La Paz Generating Facility is presented above. This section presents a summary of the emissions inventory that was used to conduct the modeling.

La Paz Generating Facility Emissions Inventory

Combined-Cycle Gas Turbine Criteria Pollutant Emissions

The CTG/HRSG criteria pollutant emissions were determined by evaluating emissions under various loads and temperatures. Emissions were calculated for load conditions of 100%, 85% and 70% under ambient temperatures of 20°F, 72°F and 115°F. Emissions were also calculated for the 100% load condition with and without duct firing. From the various emission scenarios, the worst case hourly and average annual emission rates for the CTG/HRSG units were selected for use in the modeling (see Tables B-1.12 and B-1.13).

Cooling Tower PM_{10} Emissions

The primary pollutant from the two cooling towers will be PM_{10}. The cooling towers will emit negligible amounts of other pollutants. The maximum hourly and annual PM_{10} emission rates for the cooling towers, based on continuous operation, were used in the modeling (see Table B-1.14).

Auxiliary Boiler and Emergency Generator Criteria Pollutant Emissions

The auxiliary boiler will fire natural gas only and will only be used during periods of turbine shutdown. Although the boiler is estimated to be used fewer than 2,000 hours per year, the annual emissions used in the modeling were based on continuous operation (8,760 hours per year). The annual emissions used in the modeling for the emergency generators was based on 500 hours per year operation (see Table B-1.15).

Startup Criteria Pollutant Emissions

Startups are classified as hot, warm and cold based on the duration of the proceeding shut-down period. Each individual startup involves two turbines. Startup emission rates may exceed normal operation emission rates because the control equipment has not reached operating temperatures. This is especially true for CO and NO_x. PM_{10} and SO_2 emissions are generally lower than emissions at base load because emissions of these pollutants are dependent upon fuel consumption rates which are lower under startup conditions. Consequently, the startup emissions for the modeling was limited to

CO and NO_x, and were based upon vendor supplied, uncontrolled emission calculations (see Table B-1.16).

Final Modeled Emission Rates

The final modeled hourly and annual emission rates are listed in Table B-1.16. The annual CO and NO_x emission rates were based on 50 hot, 50 warm and 50 cold startups per year, totaling 338 hours. For the 1-hour CO modeling, it was assumed two turbines would be in a cold startup mode (worst case) while the other two turbines would be under the worst case hourly emissions scenario. For the 8-hour CO modeling, it was assumed that all four turbines would be under cold startup which would span 4.73 hours of the 8-hour averaging period. The remaining time in the 8-hour period (3.27 hours) would be under the worst case hourly emissions scenario. This 8-hour scenario yields the worst case emissions among hot, warm and cold startup conditions. The emergency generators were assumed to operate only 1 hour in any given short term averaging period.

The NAAQS Inventory

The NAAQS modeling analysis presented herein includes an evaluation of the ambient impacts due to the emissions from the La Paz Generating Facility plus impacts of emissions from nearby sources. The term "nearby" is defined as any point source expected to cause a significant concentration gradient in the vicinity of the proposed new source. For PSD purposes, "vicinity" is defined as the impact area which is the circular area with a radius extending from the proposed new source to the most distant point where dispersion modeling predicts a significant impact (above the significant impact levels as defined below). The other nearby sources included in the NAAQS modeling are located within a 50 km area beyond the impact areas defined below and include sources that have been issued PSD permits and those that have submitted PSD applications that have been deemed complete. The final NAAQS inventory is listed in Appendix D. The modeling input data for these sources were supplied by ADEQ and Maricopa County. The combined modeled impacts due to the La Paz Generating Facility and nearby sources were then added to background concentrations for comparison to the applicable NAAQS.

The PSD Increment Inventory

The PSD Increment inventory is often different than the NAAQS inventory because it includes only the increment-consuming sources located within and 50 km beyond the impact area. In this case, however, the two inventories are identical. Consequently, the only difference between the NAAQS and PSD Increment modeling summarized below is that background concentrations are not added to the modeled impacts for the PSD Increment analysis.

Non-Criteria Pollutants Inventory

The La Paz Generating Facility will emit federally listed hazardous air pollutants (HAPs) and other AAAQG pollutants. A complete HAPs and AAAQG emissions inventory is presented above.

Topography, Climatology And Meteorology

Regional Topography

Regionally, the terrain surrounding the proposed facility location is characteristic of the Basin and Range Physiographic Province which is characterized by northwest to southeast trending fault-block mountains separated by broad valleys partially filled with eroded debris from the adjacent mountains

(Figure B-1.3). The Harquahala Valley is situated within the Lower Colorado Valley sub-region of the Sonoran Desert and is characterized by low annual precipitation and desert vegetation. Because of the variable terrain around the proposed facility location, the modeling includes evaluation of receptors located in simple, intermediate, and complex terrain.

Regional Climatology

The climate of the area is semi-arid with precipitation varying with elevation. Based on the long term climate record from the Harquahala Plains monitoring site (from Western Region Climate Center) the annual average maximum temperature is 85.5 °F (monthly range of 106.4 °F to 65.4 °F), the annual average minimum temperature is 49.5 °F (monthly range of 72.5 °F to 30.6 °F) and the annual average precipitation is 6.15 inches (monthly range from 0.06 inches to 1.05 inches).

Regional Meteorology

The on-site meteorological data and twice daily mixing height data described below were combined into an ISC model ready input file using the EPA program Meteorological Processor for Regulatory Models (MPRM User's Guide, EPA-454/B-96-002, August 1996, Addendum June 1999).

Surface Meteorology

As stated above, on-site meteorological monitoring began April 14, 2000. The modeling was based on one full year of data (April 15, 2000 to April 14, 2001). A summary of the meteorological data used in the modeling is provided in Appendix C. Details of the meteorological monitoring can be found in the quarterly reports for the program and the previously referenced QAPP.

Wind Speed and Wind Directions

On-site monthly average wind speeds have ranged from a high of 3.7 m/s (April 2000) to a low of 2.6 mps (November 2000). Maximum hourly wind speeds have ranged from a high monthly maximum of 12.1 mps (June 2000) to a low monthly maximum of 7.4 mps (March 2001). Wind directions have varied on a month to month and diurnal basis over the monitoring period but generally, winds have followed the up-valley/down-valley orientation of the Harquahala Valley, which is northwest/southeast. The 24 hour wind frequency distributions are summarized in Appendix K.

Stability Classes

Hourly Pasquill stability classes were determined using the hourly mean wind speed and the 15-minute sigma theta (standard deviation of the horizontal wind direction) data averaged into hourly values according to the Sigma-A method described in the EPA document: *Meteorological Monitoring Guidance for Regulatory Modeling Applications*, EPA-454/R-99-005, February 2000. Monthly stability data are summarized in Appendix C.

Data Capture

The meteorological data recovery was 100%. The bi-annual performance audit resulted in three hours of missing data for all parameters but these missing values were replaced with interpolated values using the EPA guidelines for filling in missing meteorological data.

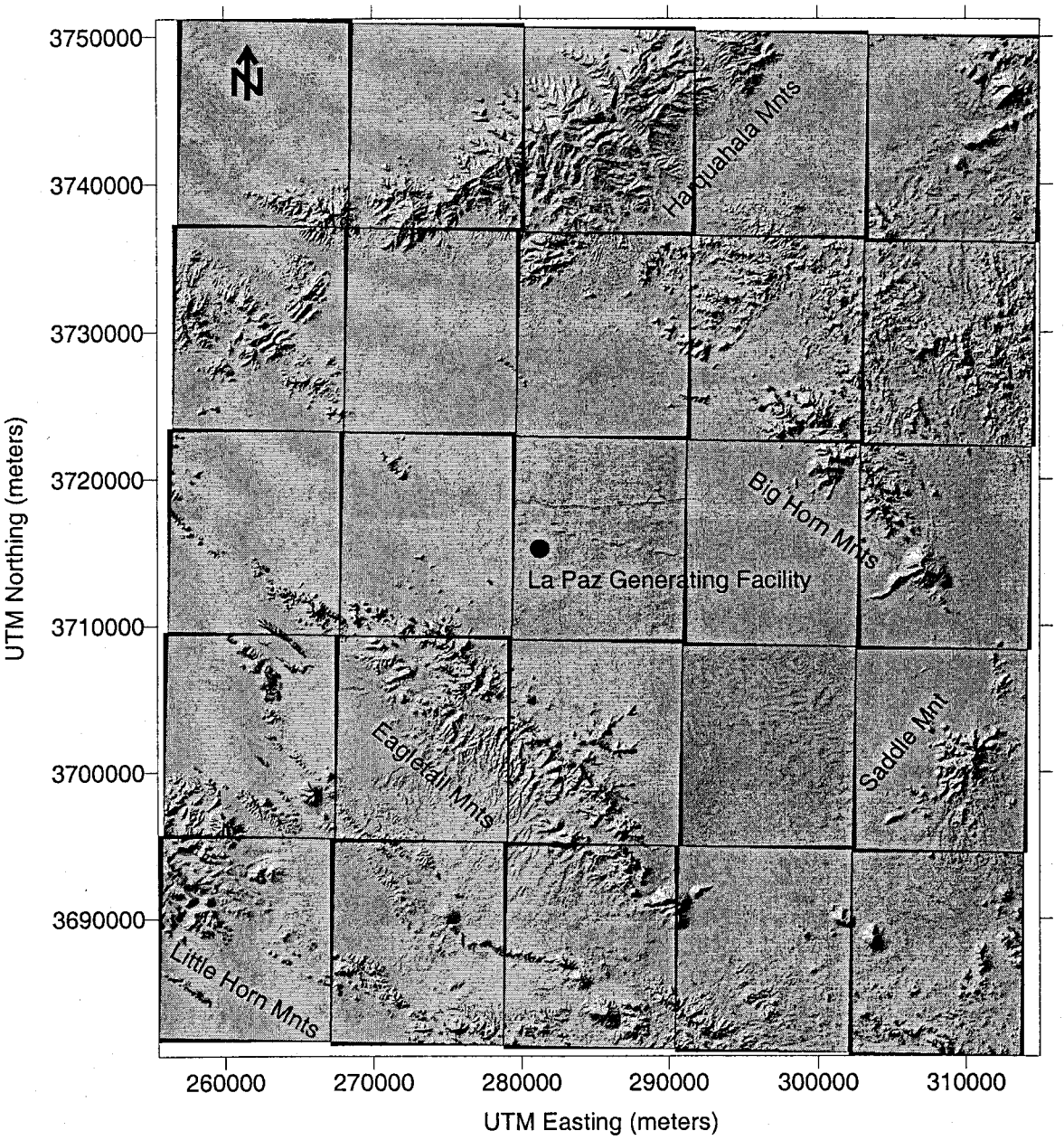


Figure B-1.3. Regional topography surrounding the La Paz Generating Facility based on USGS digitized terrain data.

Treatment of Calms

As recommended in the EPA guidance reference above, measured on-site hourly wind speeds of less than 1 mps but above the instrument threshold were set to 1.0 mps. Hourly wind speeds below the instrument threshold (0.5 mps) were considered calm and are identified in the preprocessed data file by a wind speed of 0.0 mps.

Upper Air Data

The upper air data consists of twice daily mixing height data obtained from the National Climatic Data Center (NCDC) for the year 2000. Data for 2001 is not yet available. Consequently, the mixing height data associated with the meteorological data for January 1, 2001 to April 14, 2001 are not concurrent, being from the year 2000. The mixing height data are calculated by NCDC using upper air sounding measurements and the associated surface observations collected at the National Weather Service site in Tucson, AZ. Unrealistic mixing heights (below 30 meters) were replaced with the greater of the next hour's mixing height value or 30 meters, following the air quality modeling guidelines of the Texas Natural Resources Conservation Commission (TNRCC, RG-25 Revised, February 1999).

Modeling Analysis Design

Model Selection

The air impact analysis was based on refined modeling using the Industrial Source Complex Short Term 3 (ISCST3) model, version 00101 (*Addendum, User's Guide for the Industrial Source Complex (ISC3) Dispersion Models, Volume I - User Instructions*, USEPA, Office of Air Quality Planning and Standards, Emissions, Monitoring and Analysis Division, Research Triangle Park, NC 27711, December, 1998). Applied Environmental Consultants, Inc. (AEC) uses the commercial version of the ISC3 program from Bee-Line Software (P.O. Box 7348, Asheville, NC 28802, 828-258-1895).

Model Input Defaults/Options

The recommended regulatory default options for the ISC3 model as stated in *Appendix W to Part 51-Guideline on Air Quality Models* (40 CFR Ch.1, 7-1-99 Edition) were used for the model runs. The ISC3 User's Guide provides detailed explanations of these modeling options. The following regulatory default options were incorporated into the computer runs:

- Use stack-tip downwash;
- Use buoyancy-induced dispersion;
- Do not use gradual plume rise (except for building downwash);
- Use calm processing routines;
- Use default wind speed profile exponents;
- Use default vertical potential temperature gradients;
- Use upper-bound concentration estimates for sources influenced by building downwash from super-squat buildings;

Rural/Urban Classification

For modeling purposes, the rural/urban classification of an area is determined by either the dominance of a specific land use or by population data in the study area. Generally, if one land use type is greater than 50%, the area is classified as that land use type. If the population is greater than 750 persons per km^2, the area is classified as urban. In this case, the area surrounding the proposed facility location is clearly classified as rural because rural land use is greater than 50% and the population is less than 750 persons per km^2. Thus, the rural classification was used in the modeling.

Receptor Network

Refined Grid

All of the refined modeling was conducted using a grid consisting of receptors spaced at (a) 100 m intervals along the process area boundary, (b) 100 m intervals from the process area boundary outward to 1 km, and (c) 500 m intervals from 1 km to 3 km. The receptor grid is shown on Figure B-1.4.

Discrete Receptors

Discrete receptors were placed along the closest boundary and elevated terrain locations for all of the Class II Wilderness Areas within 50 km of the proposed facility location. These are shown on Figure B-1.5 and include the following :

- Eagletail Mountains W.A.
- Big Horn Mountains W.A.
- Hummingbird Springs W.A.
- Harquahala Muntains W.A.
- Harcuvar Mountains W.A.
- New Water Mountains W.A.
- Signal Mountain W.A.

Class I Receptors

The three closest Class I Wilderness Areas and their distance from the proposed facility location are as follows:

- Pine Mountain W.A. 155 km
- Mazatzal W.A. 161 km
- Superstition W.A. 176 km

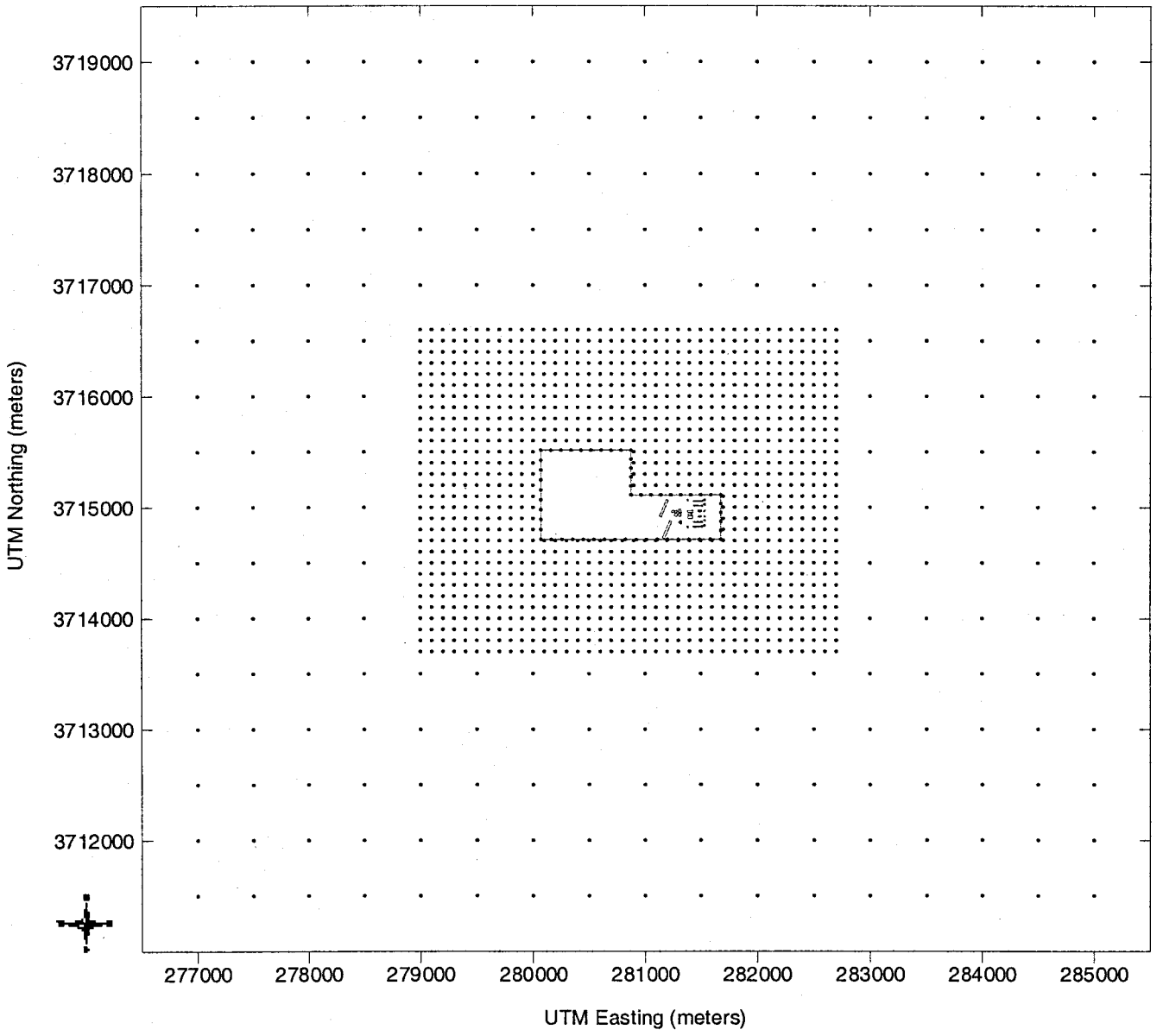


Figure B-1.4. Receptor grid network used to conduct the refined modeling.

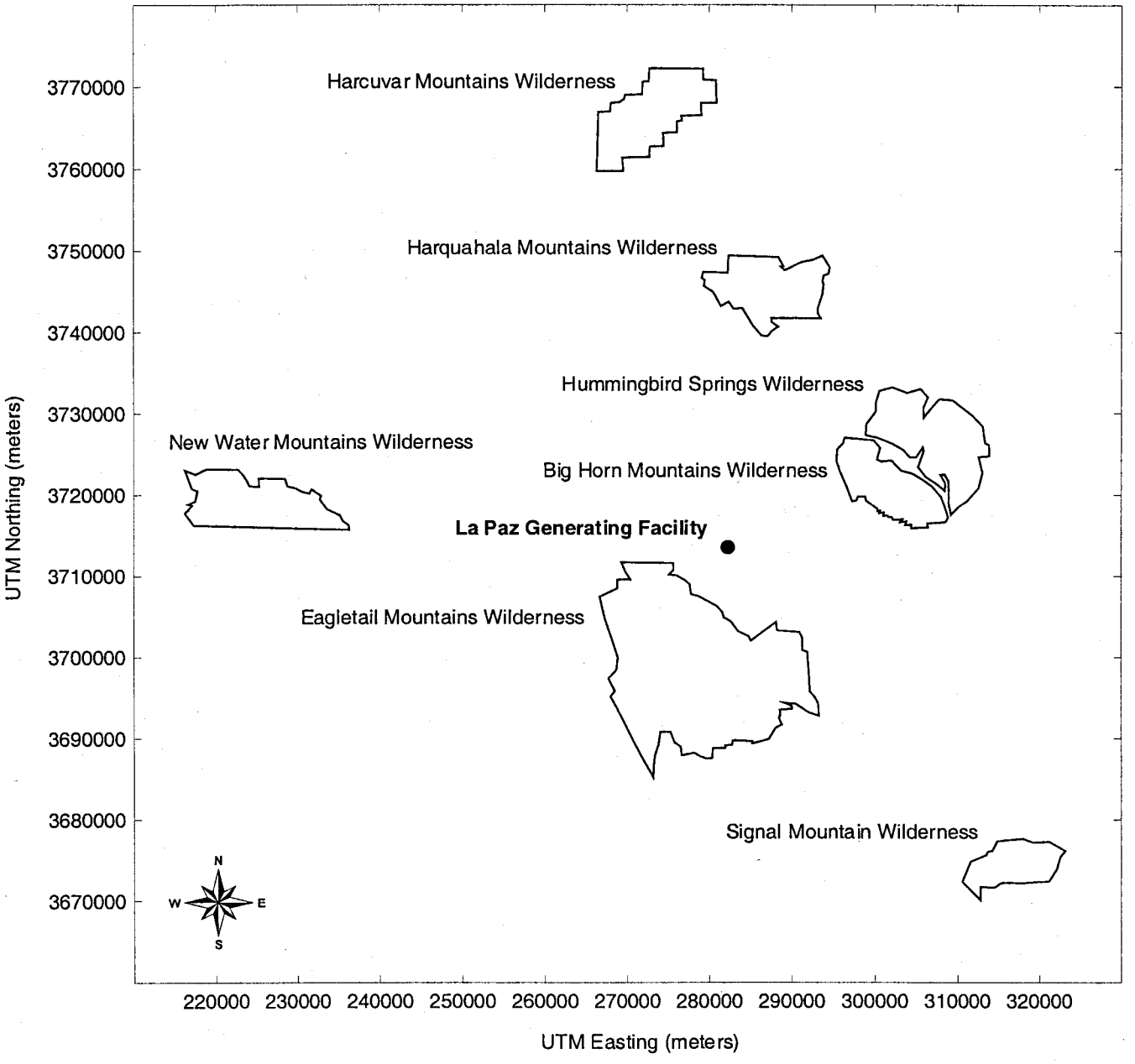


Figure B-1.5. Class II Wilderness Areas located within 50 km of the La Paz Generating Facility.

Evaluation of impacts upon any Class I area greater than 100 km from the source are not necessarily excluded from an impact analysis. The decision to require a source to perform any type of impact analysis is made by the regulatory agency in consultation with other governing bodies such as the Federal Land Managers. ADEQ staff have reviewed the possible impacts to the above Class I areas and have determined that an analysis is not necessary. This was confirmed verbally in a pre-application meeting with ADEQ staff on March 20, 2001. Consequently, the modeling summarized herein does not include an evaluation of impacts in these Class I areas.

Nonattainment Area Boundary Receptors

There are three nonattainment areas (CO, Ozone and PM_{10}) in Maricopa County. The closest western boundary of these nonattainment areas is greater than 50 km from the proposed facility. As with Class I areas, the decision to require a source to include evaluation of impacts in nearby nonattainment areas is made by the regulatory agency. ADEQ staff have reviewed the possible impacts to the Maricopa County nonattainment areas and have determined that an analysis is not necessary. This was confirmed verbally in the same ADEQ meeting referenced above.

Receptor Elevations

Receptor elevations were determined from digitized terrain data (DTD) representing 7.5-minute USGS topographic maps. Bee-Line's ISC3 software interface automatically assigns elevations from the digitized data to designated receptors. The software can employ several methods for assigning receptor elevations. The *'Linear Interpolation'* method was used to determine receptor elevations. This method interpolates between DTD elevation points to get the value at each receptor and is the most accurate method for determining elevations. In addition, according to the explanations of each method in Bee-Line's ISC3 software, the linear interpolation method is best suited for the type of receptor grid and receptor spacing used in the modeling.

Source Characterization

All emission sources were modeled as point sources. For the La Paz Generating Facility, these included the four stacks for the CTG/HRSG units, the two emergency generators, the auxiliary boiler and the two cooling towers, each of which was modeled as a series of nine point sources (one point for each cell). All "nearby" sources included in the NAAQS and PSD Increment inventories were also modeled as point sources.

Source Locations and Parameters

Source locations were based on the preliminary plan view design of the facility and are shown on Figure B-1.6. The exit temperatures and velocities for the CTG/HRSTG units vary depending on the various emissions scenarios that were developed by Black & Veatch as described above. The worst case values (with respect to dispersion) were used in the modeling. The source parameters for the emergency generators were provided by Detroit Diesel. A listing of the final source parameter data are provided in Appendix F.

Building Downwash

Building downwash effects for the La Paz Generating Facility sources were evaluated by incorporating the appropriate building dimensions from the preliminary facility design into the ISC3 input files using Bee-Line's GEP-BPIP (Building Profile Input Program) software as shown on

Figure B-1.6. The GEP-BPIP program is EPA approved and includes the latest EPA building downwash algorithms.

Dispersion Modeling Impact Analysis

Impact Area Determination

For each pollutant subject to PSD review, an impact area determination was made for each applicable averaging period and the largest area was used for the PSD Increment analysis. Complete modeling input and output files are provided on the CD in Appendix P. As defined above, the impact area is a circular area with a radius extending from the source to the most distant point where the dispersion modeling predicts a significant ambient impact. The results of the impact area analysis with comparison to the applicable significant impact levels (SILs) are summarized in Table B-1.21.

NO_x Impact Area

The impact area for NO_x, based on annual average concentrations, is shown on Figure B-1.7. The radius of impact was 1.8 km.

SO2 Impact Area

Modeling was conducted to determine the SO_2 impact areas for the 3-hour, 24-hour and annual averaging periods. The 3-hour averaging period had the largest impact area with a radius of impact of 1.5 km. The 3-hour SO_2 impact area is shown on Figure B-1.8, which is limited to showing only the 100 meter spaced receptor grid for clarity.

PM_{10} Impact Area

Modeling was conducted to determine the PM_{10} impact areas for the 24-hour and annual averaging periods. The largest impact area was for the 24-hour averaging period which is shown on Figure B-1.9. The radius of impact for the 24-hour averaging period is 0.6 km.

CO Impact Area

There are no PSD increments for CO. Consequently, the CO impact area modeling was conducted solely to compare predicted impacts with the applicable SILs. As stated in the *New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting* (NSR Manual), Draft, October 1990, if the preliminary analysis of impacts are below the applicable SILs, no further NAAQS analyses are required. The results of the CO impact area analysis summarized in Table B-1.21 indicate that the CO impacts are below the applicable SILs. Consequently, the NAAQS analysis summarized below does not include an evaluation of CO emissions.

Full Impact Analysis

The full impact analysis included: (a) the NAAQS analysis, (b) the PSD Increment analysis, and (c) the AAAQG analysis. Each analysis is summarized below. Complete modeling input and output files are included on the CD in Appendix P.

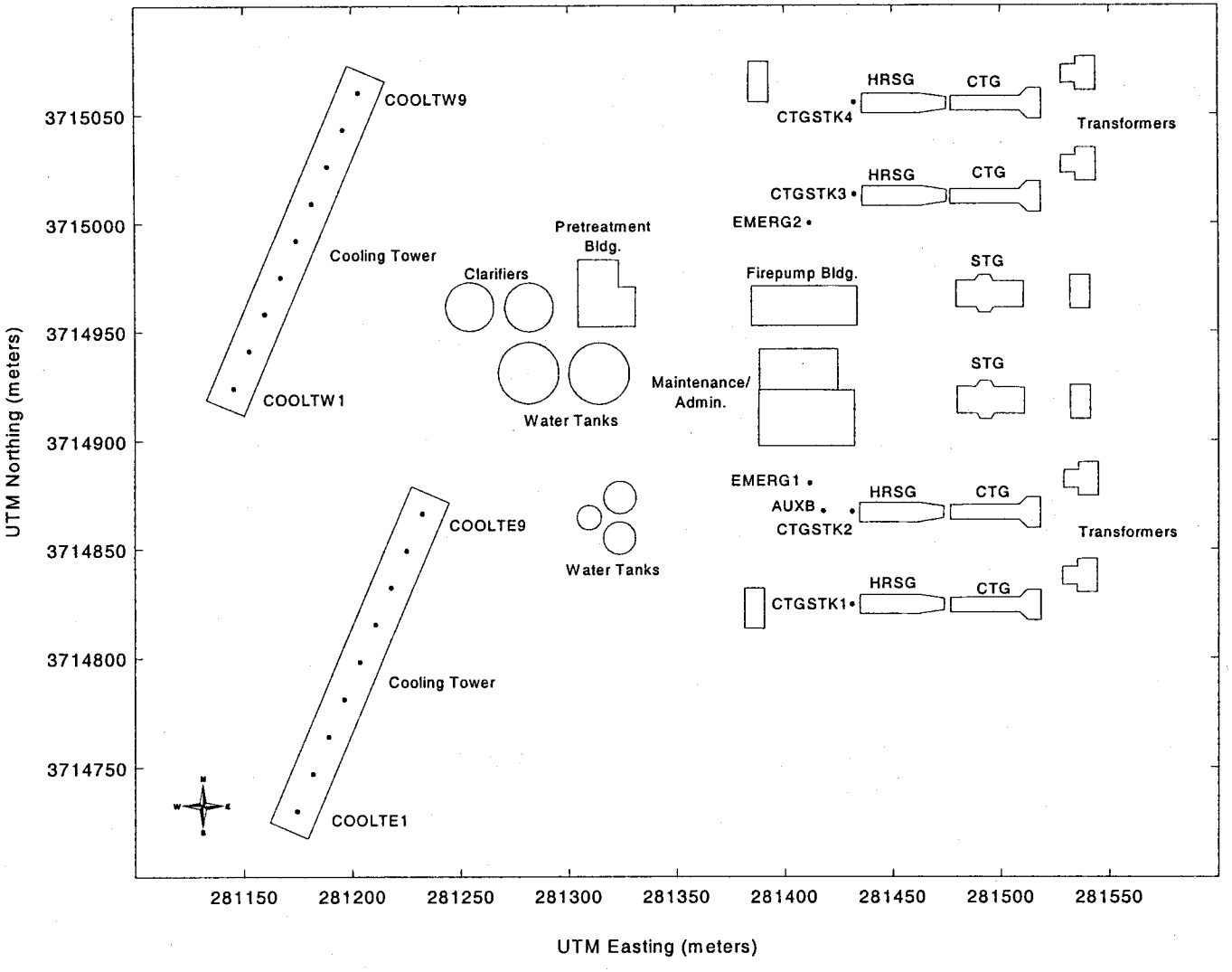


Figure B-1.6. Plan view of La Paz Generating Facility showing source locations and downwash structures.

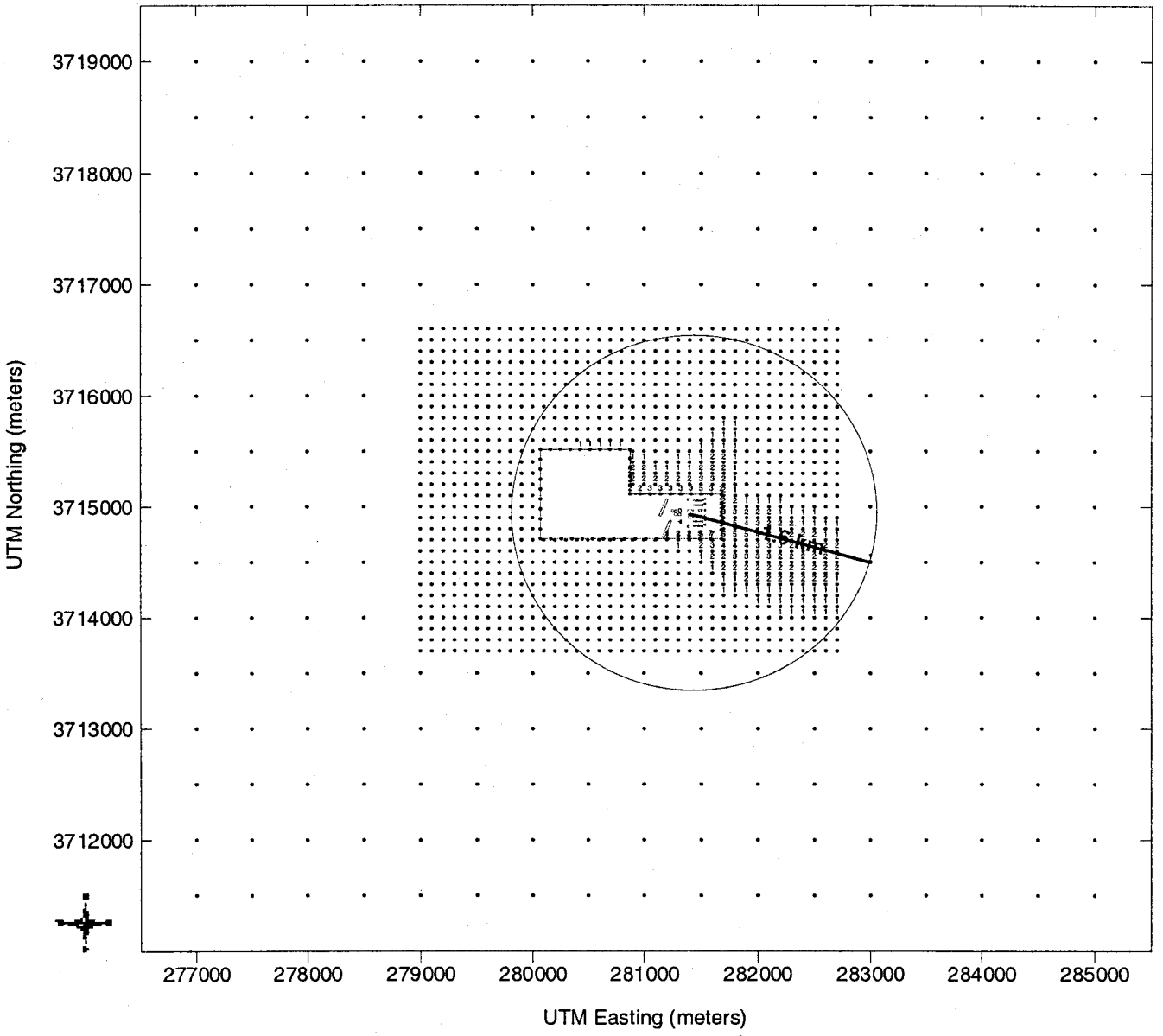


Figure B-1.7. **Impact area for NO_x with radius of impact of 1.6 km, showing annual concentrations above SIL of 1 $\mu g/m^3$.**

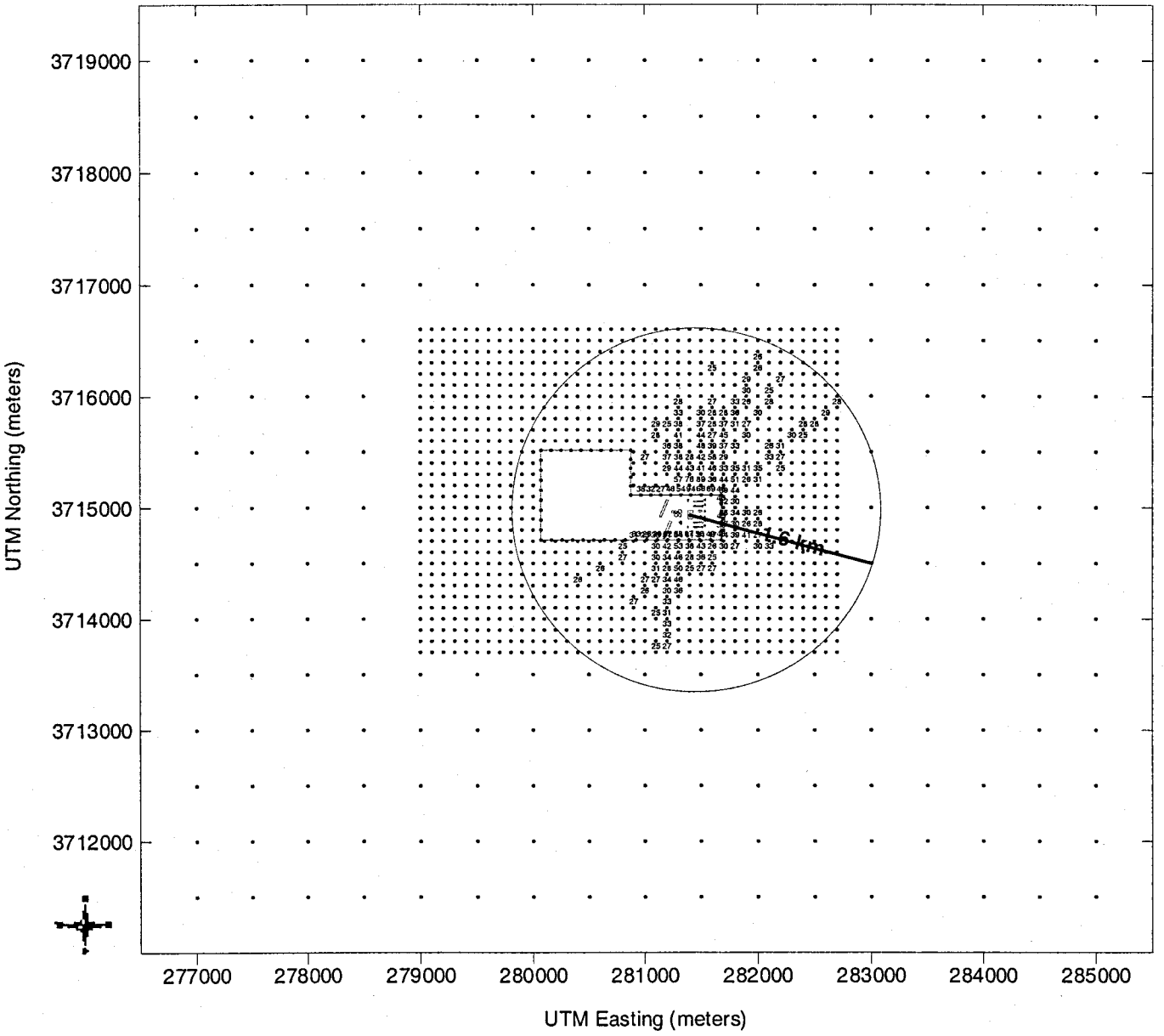


Figure B-1.8. **Impact area for SO_2 with radius of impact of 1.6 km, showing 1st high 3-hour concentrations above SIL of 25 $\mu g/m^3$.**

TABLE B-1.21 SUMMARY OF IMPACT AREA ANALYSIS						
			Receptor Location			
Pollutant	Averaging Period	Predicted 1st Highest Concentration ($\mu g/m^3$)	UTM Easting (meters)	UTM Northing (meters)	Significant Impact Level ($\mu g/m^3$)	Radius of Impact (km)
NO_x	Annual	8.7	281680	3714791	1	1.6
SO_2	3-Hr	94.1	281412	3515113	25	1.6
	24-Hr	4.1	281500	3715200	5	NA
	Annual	0.9	281680	3714791	1	NA
PM_{10}	24-Hr	8.6	281400	3715300	5	0.7
	Annual	0.8	281680	3714791	1	NA
CO	1-Hr	774	281396	3714710	2000	NA
	8-Hr	346	281500	3715300	500	NA

The NAAQS Analysis

Worst-case emissions from the La Paz Generating Facility, along with emissions from sources included in the NAAQS emissions inventory described above, were modeled to estimate maximum ambient concentrations. The locations of the maximum impacts for all pollutants are shown on Figure B-1.10. The background concentrations described above were added to the modeled concentrations to determine worst-case impacts for comparison to the applicable NAAQS.

Results of the NAAQS modeling are summarized in Table B-1.22. The results indicate that the combined ambient impacts due to emissions from the La Paz Generating Facility, other nearby sources, and background concentrations do not exceed the applicable NAAQS.

The PSD Increment Analysis

Worst-case emissions from the La Paz Generating Facility, along with emissions from other increment consuming sources, were modeled to estimate maximum ambient concentrations for comparison to the applicable PSD Increments. As stated above, the NAAQS and PSD Increment inventories are identical. Consequently, the locations of the maximum impacts shown on Figure B-1.10 apply for both the NAAQS and PSD Increment analyses.

Results of the PSD Increment modeling are also summarized in Table B-1.22. The results indicate that the combined ambient impacts due to emissions from the La Paz Generating Facility and other increment consuming sources do not exceed the applicable PSD Increments.

The AAAQG Analysis

The non-criteria emissions inventory described above was modeled to determine maximum ambient concentrations due to such emissions. Because of the large number of AAAQG emission species, the modeling was conducted using a unit emission rate (1 g/s) from three source groups defined as: (1) the four CTG/HRSTG stacks (modeled with a 0.25 g/s emission rate per stack), (2) the auxiliary boiler, and (3) the two emergency generators (modeled with a 0.5 g/s emission rate per generator). Separate model runs were made for each source group to determine maximum 1-hour, 24-hour and annual impacts. These modeled impacts were then multiplied by the actual emission rate of each

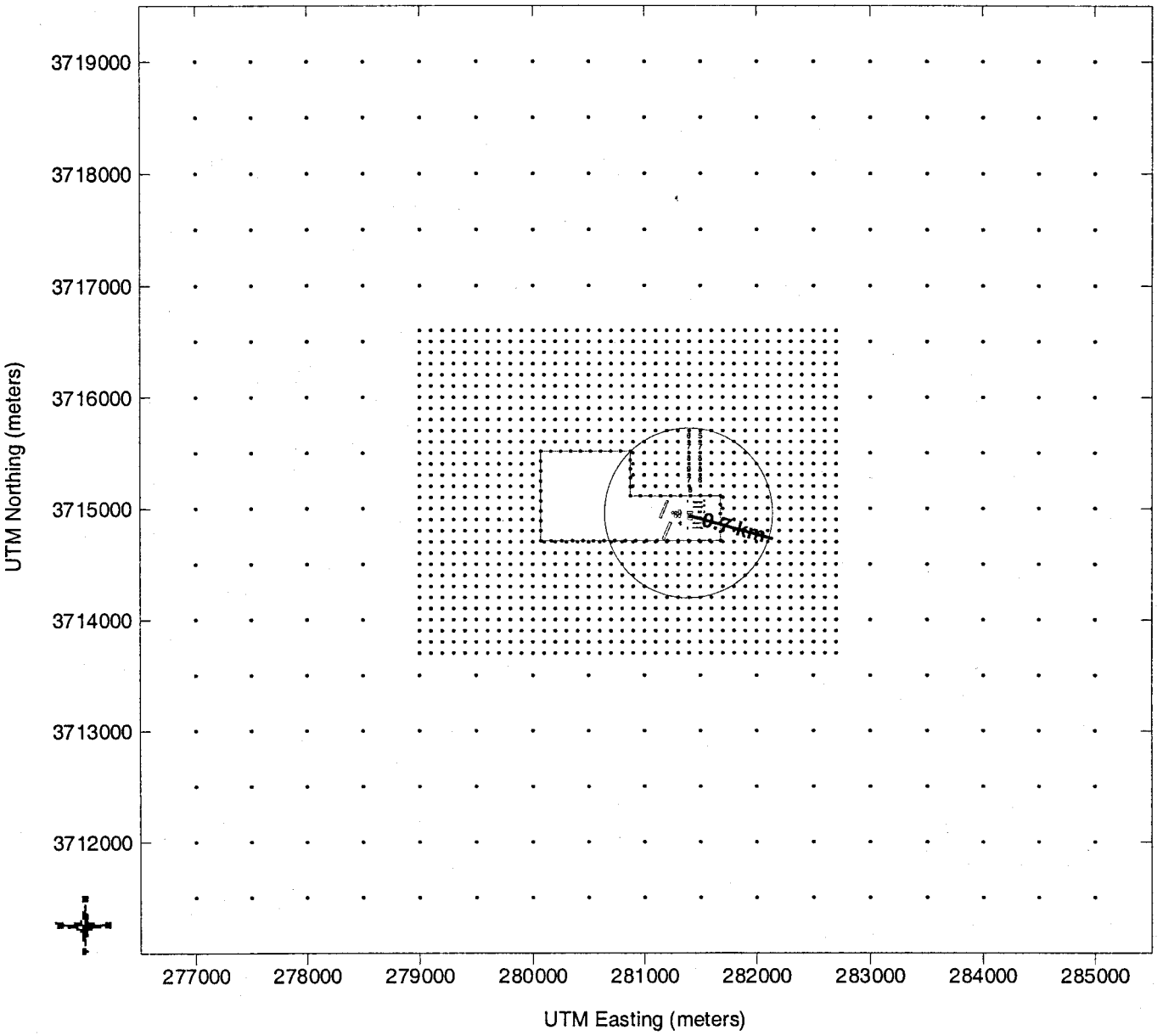
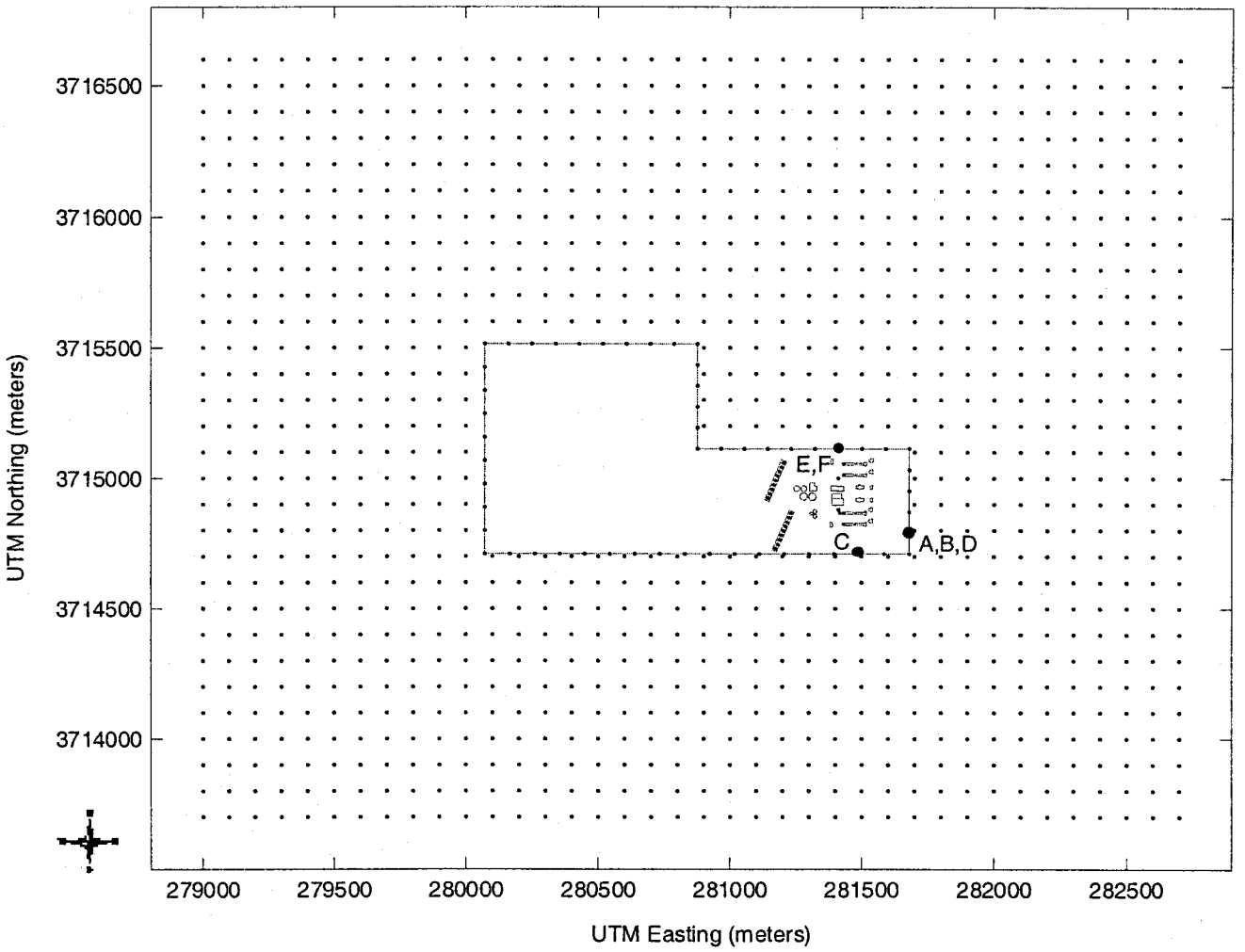


Figure B-1.9. Process flow diagram of the La Paz Generating Facility.



Concentration (ug/m3) Location Index

A: Highest Annual NOx (9.6)
B: Highest Annual PM10 (1.1)
C: Highest 2nd High 24-Hr PM10 (4.5)
D: Highest Annual SO2 (0.9)
E: Highest 2nd High 3-hour SO2 (88.7)
F: Highest 2nd High 24-hour SO2 (3.0)

Figure B-1.10. Receptor grid showing locations of predicted maximum criteria pollutant concentrations used in the NAAQS and PSD Increment analyses.

emissions specie (converted to g/s) to determine ambient concentrations due to each source group. The ambient concentrations of each emissions specie due to each source group were then summed for comparison to the applicable AAAQGs. The unit emission rate modeling input and output modeling files are included on the CD in Appendix P.

The final results of the AAAQG analysis are summarized in Table B-1.23. The results indicate that the combined ambient impacts due to emissions from each source group at the La Paz Generating Facility do not exceed the applicable AAAQG levels.

Ambient Impacts in Class II Wilderness Areas

As part of the refined modeling, discrete receptors were placed in the seven Class II wilderness areas defined above to determine potential ambient impacts due to emissions from the La Paz Generating Facility. Receptors were placed along the closest boundary and at elevated terrain locations within the wilderness area. The complete modeling input and output files are included on the CD in Appendix P. The results of the modeling are summarized in Table B-1.24. All of the predicted maximum impacts were well below the Class II SILs.

Additional Impact Analysis

Commercial, Residential and Industrial Growth Analysis

The La Paz Generating Facility will be constructed in a sparsely populated area within the Harquahala Valley. The existing labor force is therefore inter-dispersed throughout the surrounding communities. For the construction phase of the project, the existing labor force may increase with an influx of out-of-state workers but it is likely that most of these workers will reside in existing nearby communities since the construction phase will be temporary. At full operation, the facility will employ 30 to 40 people, a labor force of a size that will not promote local residential or commercial development. In addition, the electrical generation aspect of the facility will not promote adjacent industrial growth because the electricity will be sold to the existing grid for use by distant consumers. Therefore, the construction and operation of the La Paz Generating Facility will not create any significant commercial, residential or industrial impacts that could have additional adverse affects on air quality.

Soils and Vegetation Analysis

The NAAQS have been established to protect public health and welfare from any adverse effects due to criteria pollutant emissions, including effects on soils and vegetation. According to the NSR Manual, for most types of soils and vegetation, ambient concentrations of criteria pollutants below the NAAQS will not result in harmful effects. As shown in Table B-1.22, the predicted maximum impacts due to emissions from the La Paz Generating Facility are well below the applicable NAAQS. Therefore, it is concluded that emissions from the La Paz Generation Facility will not result in any harmful effects on soils and vegetation.

Visibility Impairment Analysis

The visibility impact analysis presented herein was performed in accordance with procedures outlined in: *Workbook for Plume Visual Impact Screening and Analysis (Revised)*, U.S. EPA, Office of Air Quality Planning and Standards, October 1992, EPA-454/R-92-023. Two visibility screening levels were applied to assess visibility inside the seven Class II Wilderness Areas surrounding the La Paz Generating Facility shown on Figure B-1.5. The analysis was conducted using the EPA approved VISCREEN computer model. Level 1 screening is designed to provide a conservative estimate of

TABLE B-1.22 SUMMARY OF THE NAAQS AND PSD INCREMENT IMPACT ANALYSES								
			Receptor Location					
Pollutant	Averaging Period	Predicted Maximum 2nd Highest [a] Concentration ($\mu g/m^3$)	UTM Easting (meters)	UTM Northing (meters)	Class II PSD Increment ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Maximum Potential Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_x	Annual	9.6	281680	3714791	25	6	16	100
SO_2	3-Hr	88.7	281412	3715113	512	31	120	1,300
	24-Hr	3.0	281412	3715113	91	10	13	365
	Annual	0.9	281680	3714791	20	4	5	80
PM_{10}	24-Hr	4.5	281491	3714710	30	58	63	150
	Annual	1.1	281680	3714791	17	16	17	50

[a] The predicted annual concentrations are maximum values.

TABLE B-1.23
SUMMARY OF AAAQG MODELING RESULTS

AAAQG Pollutant	1-Hour Impact ($\mu g/m^3$)	1-Hour AAAQG ($\mu g/m^3$)	24-Hour Impact ($\mu g/m^3$)	24-Hour AAAQG ($\mu g/m^3$)	Annual Impact ($\mu g/m^3$)	Annual AAAQG ($\mu g/m^3$)
1,3-Butadiene	1.3E-03	5.0E+00	2.7E-04	1.3E+00	4.8E-06	3.6E-03
Acetaldehyde	1.4E-01	6.3E+02	1.2E-02	1.7E+02	1.6E-03	4.5E-01
Acrolein	2.9E-02	6.3E+00	5.4E-03	2.0E+00	2.7E-04	.
Ammonia	3.9E+01	2.3E+02	7.9E+00	1.4E+02	1.4E-01	.
Benzene	9.6E-01	1.7E+02	1.5E-01	4.4E+01	2.0E-02	1.2E-01
Benzo(a)anthracene	8.0E-04	6.0E+00	1.2E-04	1.6E+00	1.6E-05	4.8E-03
Benzo(a)pyrene	3.5E-04	6.7E-01	5.5E-05	1.8E-01	6.7E-06	4.8E-04
Dibenz(a,h)anthracene	4.8E-04	6.7E-01	7.6E-05	1.8E-01	9.1E-06	4.8E-04
Dichlorobenzene	1.2E-02	2.0E+02	1.2E-03	5.3E+01	9.3E-05	1.5E-01
Ethylbenzene	9.9E-02	4.5E+03	2.0E-02	3.5E+03	3.6E-04	.
Formaldehyde	7.0E-01	2.5E+01	5.7E-02	1.6E+01	7.2E-03	7.6E-02
Hexane	1.4E+01	5.4E+03	8.9E-01	1.4E+03	1.2E-01	.
Naphthalene	1.6E-01	6.3E+02	2.4E-02	4.0E+02	3.3E-03	.
Propylene Oxide	9.0E-02	3.7E+02	1.8E-02	9.8E+01	3.3E-04	2.7E-01
Toluene	7.6E-01	4.4E+03	1.3E-01	3.0E+03	8.8E-03	.
Xylene (Total)	4.2E-01	5.4E+03	7.5E-02	3.5E+03	5.6E-03	.
Arsenic	2.3E-03	6.0E-02	2.3E-04	1.6E-02	1.7E-05	2.3E-04
Barium	4.5E-02	1.5E+01	4.5E-03	4.0E+00	3.4E-04	.
Beryllium	1.2E-04	6.0E-02	1.2E-05	1.6E-02	9.3E-07	4.2E-04
Cadmium	1.1E-02	7.7E-01	1.1E-03	2.0E-01	8.5E-05	5.6E-04
Chromium	1.4E-02	1.5E+01	1.4E-03	4.0E+00	1.1E-04	.
Copper	8.7E-03	3.0E+00	8.7E-04	7.9E-01	6.6E-05	.
Manganese	3.9E-03	2.5E+01	3.9E-04	7.9E+01	2.9E-05	.
Mercury	2.7E-03	1.5E+00	2.7E-04	4.0E-01	2.0E-05	.
Nickel	2.2E-02	4.5E-01	2.2E-03	1.2E-01	1.6E-04	2.1E-03
Selenium	2.5E-04	6.0E+00	2.5E-05	1.6E+00	1.9E-06	.
Vanadium	2.4E-02	1.5E+00	2.4E-03	4.0E-01	1.8E-04	.

The impacts were calculated as follows:

1-hour impacts = (CTG/HRSTG emissions x 2.75) + (AUXB emissions x 1060) + (EMERG emissions x 462.5)

24-hour impacts = (CTG/HRSTG emissions x 0.56) + (AUXB emissions x 54.6) + (EMERG emissions x 70.3)

Annual impacts = (CTG/HRSTG emissions x 0.01) + (AUXB emissions x 9.7) + (EMERG emissions x 10.0)

See Appendix H for emission rates of each emission species from each source group.

Emissions in above equations are in g/s.

Multipliers in above equations represent predicted maximum concentrations ($\mu g/m^3$) based on modeling a unit emission rate

(1 g/s) from each source group. See modeling output files on CD in Appendix P.

TABLE B-1.24 CLASS II WILDERNESS AREA AMBIENT IMPACTS DUE TO EMISSIONS FROM THE LA PAZ GENERATING FACILITY								
	Maximum Ambient Impacts ($\mu g/m^3$)							
Wilderness Area	**CO 1-Hour**	**CO 8-Hour**	**NO_x Annual**	**PM_{10} 24-Hour**	**PM_{10} Annual**	**SO_2 3-Hour**	**SO_2 24-Hour**	**SO_2 Annual**
Harcuvar Mountains	19	6	0.01	0.2	0.02	0.2	0.03	0.003
Harquahala Mountains	60	16	0.04	0.4	0.05	0.5	0.1	0.01
Hummingbird Springs	123	33	0.06	0.8	0.07	1.1	0.1	0.01
Big Horn Mountains	145	36	0.08	0.8	0.09	2.1	0.2	0.02
Signal Mountain	80	10	0.04	0.4	0.05	0.8	0.1	0.01
Eagletail Mountains	237	57	0.13	2.5	0.16	6.4	0.4	0.03
New Water Mountains	85	21	0.02	0.4	0.03	0.5	0.1	0.004
Class II SIL	2,000	500	1	5	1	25	5	1

worst-day plume visual impacts using assumed worst-case meteorological conditions (Pasquill stability class F with 1 meter/second wind speeds persisting for 12 hours with a wind that would transport the plume adjacent to the observer). Level 2 screening, applied when screening criteria at Level 1 are exceeded, has the same objectives as Level 1 but allows for more realistic meteorological and plume composition inputs representative of the given source and on-site meteorology.

Model Input Parameters

Inputs to the VISCREEN model consist of the following parameters:

- emission rates of primary PM_{10} and NO_2;
- distance between the source and observer who is located at the nearest boundary of the Class II area;
- distance between the source and the furthest boundary of the Class II area along the assumed worst-case plume centerline; and
- background visual range (in this case, 110 kilometers - selected from Figure 9 in EPA Workbook).

The Level 2 screening, allows the following changes to the input parameters:

- particle size characteristics (default values used);
- background ozone concentration (left at default value of 0.04 ppm);
- plume-source-observer angle (left at default value of 11.25°); and
- Pasquill stability class with associated wind speed (these were altered as explained below).

Both the Level 1 and Level 2 screening analyses were conducted using the annual emission rates listed in Table B-1.17. The plume-observer geometries used to measure distances for inputs to the VISCREEN model for each wilderness area are shown on Figure B-1.11.

VISCREEN Level 2 input for Pasquill stability and wind speed is based on a detailed analysis of on-site wind speed, wind direction and Pasquill stability classes. The complete procedure is explained in the EPA Workbook. Generally described, the on-site meteorology is analyzed by looking at stability frequency distributions categorized by wind direction, wind speed and time of day. The wind speed and stability class associated with the wind direction which would bring about worst-case plume visibility impacts are selected as inputs to the model.

Model Output Parameters

The VISCREEN output file includes the results of two tests which calculate Delta-E (plume perceptibility) and Contrast. Both tests are conducted to evaluate impacts inside the Class II area under simulations of both a sky and terrain background for two assumed worst-case sun angles (forward scatter – 10° and backward scatter – 140°) and 34 viewing angles. Detailed explanations of how the VISCREEN model calculates Delta-E and Contrast are presented in the EPA Workbook. The VISCREEN output tables for all Level 1 and Level 2 screening analyses are included in Appendix N.

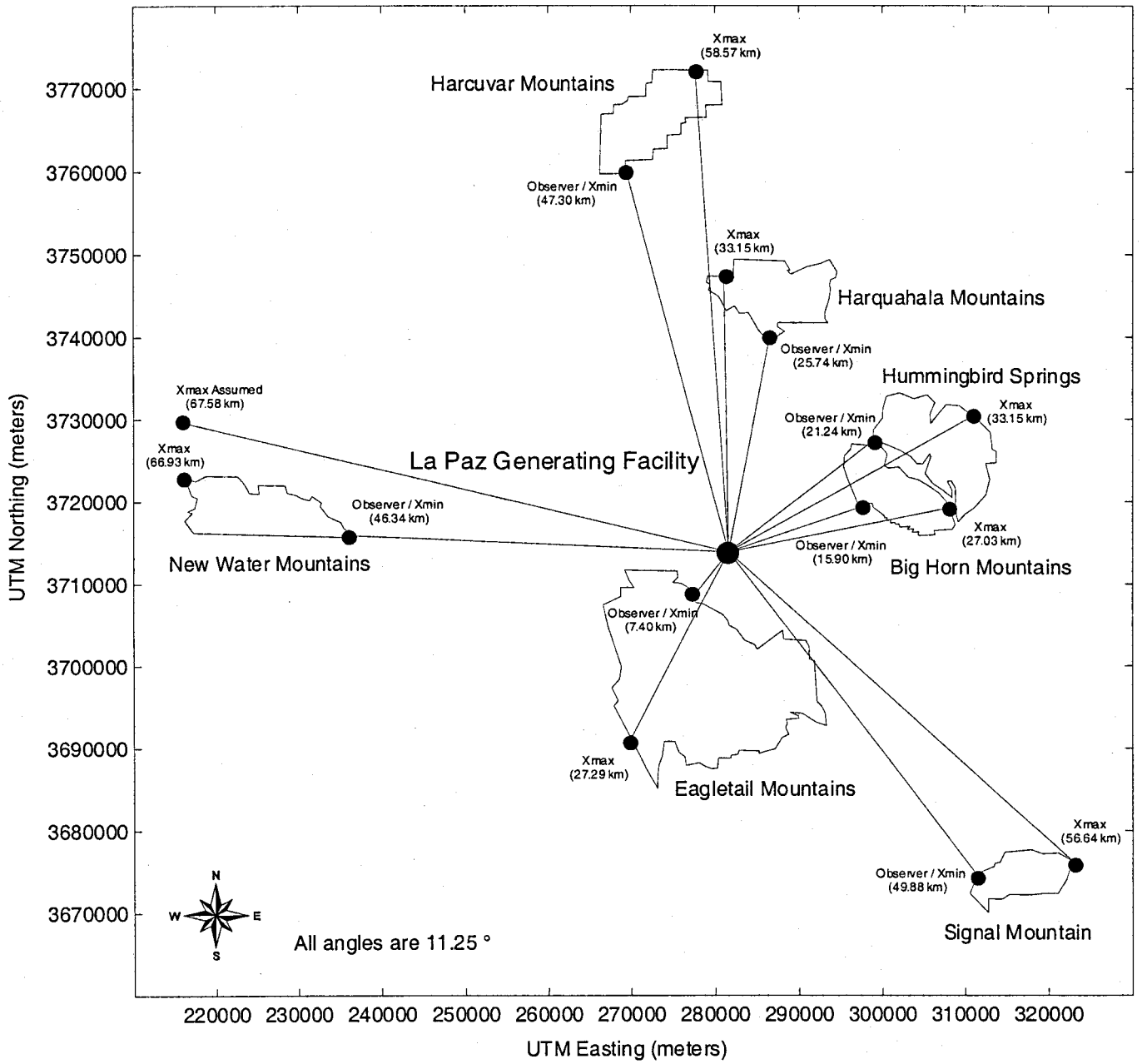


Figure B-1.11. Plume-observer geometry used in the visibility modeling for each wilderness area.

Level 1 Screening Results

The results of the VISCREEN Level 1 modeling showed that the screening criteria for Delta E and Contrast were exceeded for all seven wilderness areas. Consequently, a Level 2 screening analysis was required for each wilderness area.

Level 2 Screening Results

Level 2 screening was performed for all seven Class II Wilderness Areas due to the exceedances noted in the Level 1 screening. Default particle size and density values were used in the Level 2 screening. The default wind speed and Pasquill stability class parameters were changed for the Level 2 screening based on the procedures outlined in the EPA Workbook. The on-site meteorological data used in the ISC3 dispersion modeling were evaluated to determine worst-case meteorology. The adjusted wind speeds and stabilities used in the Level 2 screening for each wilderness area are listed in Table B-1.25. The wind speed stability worksheets are included in Appendix O.

The results of the Level 2 screening for each wilderness area are summarized in Tables B-1.26 to B-1.32. The results indicate no exceedances of the Delta-E and Contrast screening criteria.

Class I Impact Analysis

As previously stated, the closest Class I areas to the proposed facility location are beyond 150 km. Per agreement with ADEQ, a Class I impact analysis was not required.

TABLE B-1.25
ADJUSTED WIND SPEEDS AND STABILITIES USED IN THE LEVEL 2 VISIBILITY SCREENING

Wilderness Area	Adjusted Wind Speed (m/s) / For Direction	Adjusted Stability
Harcuvar Mountains	2.5 / SSE	C
Harquahala Mountains	6.5 / SSW	D
Hummingbird Springs	8.5 / SW	D
Big Horn Mountains	11.5 / WSW	D
Signal Mountain	4.5 / NW	E
Eagletail Mountains	2.5 / NE	C
New Water Mountains	4.0 / E	D

TABLE B-1.26 SUMMARY RESULTS OF THE LEVEL 2 SCREENING ANALYSIS FOR THE HARCUVAR MOUNTAINS WILDERNESS AREA

Input Emissions for

Particulates	535.2	tons/yr
NO_X (as NO_2)	411.6	tons/yr
Primary NO_2	0.00	tons/yr
Soot	0.00	tons/yr
Primary SO_4	0.00	tons/yr

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	0.04	Ppm
Background Visual Range:	110.00	Km
Source-Observer Distance:	47.30	Km
Min. Source-Class I Distance:	47.30	Km
Max. Source-Class I Distance:	58.57	Km
Plume-Source-Observer Angle:	11.25	Degrees
Stability:	3	
Wind Speed:	2.5	m/s

RESULTS

Asterisks (*) Indicate Plume Impacts that Exceed Screening Criteria

Maximum Visual Impacts INSIDE Class II Area

Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Background	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
Sky	10	132	58.6	37	11.44	0.078	0.21	0.001
Sky	140	132	58.6	37	4.86	0.021	0.21	-0.001
Terrain	10	84	47.3	84	11.09	0.141	0.26	0.001
Terrain	140	84	47.3	84	4.91	0.014	0.26	0.000

TABLE B-1.27
SUMMARY RESULTS OF THE LEVEL 2 SCREENING ANALYSIS FOR THE HARQUAHALA MOUNTAINS WILDERNESS AREA

Input Emissions for

Particulates	535.2 tons/yr	
NO_X (as NO_2)	411.6 tons/yr	
Primary NO_2	0.00 tons/yr	
Soot	0.00 tons/yr	
Primary SO_4	0.00 tons/yr	
**** Default Particle Characteristics Assumed		
Transport Scenario Specifications:		
Background Ozone:	0.04	ppm
Background Visual Range:	110.00	km
Source-Observer Distance:	25.74	km
Min. Source-Class I Distance:	25.74	km
Max. Source-Class I Distance:	33.15	km
Plume-Source-Observer Angle:	11.25	degrees
Stability:	4	
Wind Speed:	6.5	m/s

RESULTS

Asterisks (*) Indicate Plume Impacts that Exceed Screening Criteria

Maximum Visual Impacts INSIDE Class II Area

Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Background	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
Sky	10	136	33.2	32	2.42	0.381	0.05	0.006
Sky	140	136	33.2	32	2.00	0.120	0.05	-0.004
Terrain	10	84	25.7	84	2.55	0.897	0.07	0.006
Terrain	140	84	25.7	84	2.00	0.073	0.07	0.001

TABLE B-1.28
SUMMARY RESULTS OF THE LEVEL 2 SCREENING ANALYSIS FOR THE HUMMINGBIRD SPRINGS WILDERNESS AREA

Input Emissions for

Particulates	535.2	tons/yr
NO_X (as NO_2)	411.6	tons/yr
Primary NO_2	0.00	tons/yr
Soot	0.00	tons/yr
Primary SO_4	0.00	tons/yr

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	0.04	ppm
Background Visual Range:	110.00	km
Source-Observer Distance:	21.24	km
Min. Source-Class I Distance:	21.24	km
Max. Source-Class I Distance:	33.15	km
Plume-Source-Observer Angle:	11.25	degrees
Stability:	4	
Wind Speed:	8.5	m/s

RESULTS

Asterisks (*) Indicate Plume Impacts that Exceed Screening Criteria

Maximum Visual Impacts INSIDE Class II Area

Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Background	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
Sky	10	150	33.2	19	2.00	0.442	0.05	0.007
Sky	140	150	33.2	19	2.00	0.126	0.05	-0.004
Terrain	10	84	21.2	84	2.64	0.904	0.07	0.006
Terrain	140	84	21.2	84	2.00	0.070	0.07	0.001

TABLE B-1.29
SUMMARY RESULTS OF THE LEVEL 2 SCREENING ANALYSIS FOR THE BIG HORN MOUNTAINS WILDERNESS AREA

Input Emissions for

Particulates	535.2 tons/yr	
NO_X (as NO_2)	411.6 tons/yr	
Primary NO_2	0.00 tons/yr	
Soot	0.00 tons/yr	
Primary SO_4	0.00 tons/yr	
**** Default Particle Characteristics Assumed		
Transport Scenario Specifications:		
Background Ozone:	0.04	ppm
Background Visual Range:	110.00	km
Source-Observer Distance:	15.90	km
Min. Source-Class I Distance:	15.90	km
Max. Source-Class I Distance:	27.03	km
Plume-Source-Observer Angle:	11.25	degrees
Stability:	4	
Wind Speed:	11.5	m/s

RESULTS

Asterisks (*) Indicate Plume Impacts that Exceed Screening Criteria

Maximum Visual Impacts INSIDE Class II Area

Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Background	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
Sky	10	154	27.0	15	2.00	0.457	0.05	0.008
Sky	140	154	27.0	15	2.00	0.134	0.05	-0.005
Terrain	10	84	15.9	84	2.75	1.001	0.08	0.006
Terrain	140	84	15.9	84	2.00	0.073	0.08	0.001

TABLE B-1.30
SUMMARY RESULTS OF THE LEVEL 2 SCREENING ANALYSIS FOR THE SIGNAL MOUNTAIN WILDERNESS AREA

Input Emissions for

Particulates	535.2	tons/yr
NO_X (as NO_2)	411.6	tons/yr
Primary NO_2	0.00	tons/yr
Soot	0.00	tons/yr
Primary SO_4	0.00	tons/yr

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	0.04	ppm
Background Visual Range:	110.00	km
Source-Observer Distance:	49.88	km
Min. Source-Class I Distance:	49.88	km
Max. Source-Class I Distance:	56.64	km
Plume-Source-Observer Angle:	11.25	degrees
Stability:	5	
Wind Speed:	4.5	m/s

RESULTS

Asterisks (*) Indicate Plume Impacts that Exceed Screening Criteria

Maximum Visual Impacts INSIDE Class II Area

Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Background	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
Sky	10	117	56.6	52	2.00	0.568	0.05	0.009
Sky	140	117	56.6	52	2.00	0.164	0.05	-0.006
Terrain	10	84	49.9	84	2.00	0.980	0.05	0.009
Terrain	140	84	49.9	84	2.00	0.099	0.05	0.003

TABLE B-1.31
SUMMARY RESULTS OF THE LEVEL 2 SCREENING ANALYSIS FOR THE EAGLETAIL MOUNTAINS WILDERNESS AREA

Input Emissions for

Particulates	535.2	tons/yr
NO_X (as NO_2)	411.6	tons/yr
Primary NO_2	0.00	tons/yr
Soot	0.00	tons/yr
Primary SO_4	0.00	tons/yr

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	0.04	ppm
Background Visual Range:	110.00	km
Source-Observer Distance:	7.40	km
Min. Source-Class I Distance:	7.40	km
Max. Source-Class I Distance:	27.29	km
Plume-Source-Observer Angle:	11.25	degrees
Stability:	3	
Wind Speed:	2.5	m/s

RESULTS

Asterisks (*) Indicate Plume Impacts that Exceed Screening Criteria

Maximum Visual Impacts INSIDE Class II Area

Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Background	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
Sky	10	165	27.3	4	5.09	0.935	0.09	0.014
Sky	140	165	27.3	4	2.16	0.225	0.09	-0.009
Terrain	10	84	7.4	84	7.28	3.701	0.29	0.014
Terrain	140	84	7.4	84	3.29	0.257	0.29	0.002

TABLE B-1.32
SUMMARY RESULTS OF THE LEVEL 2 SCREENING ANALYSIS FOR THE NEW WATER MOUNTAINS WILDERNESS AREA

Input Emissions for

Particulates	535.2 tons/yr	
NO_X (as NO_2)	411.6 tons/yr	
Primary NO_2	0.00 tons/yr	
Soot	0.00 tons/yr	
Primary SO_4	0.00 tons/yr	
**** Default Particle Characteristics Assumed		
Transport Scenario Specifications:		
Background Ozone:	0.04	ppm
Background Visual Range:	110.00	km
Source-Observer Distance:	46.34	km
Min. Source-Class I Distance:	46.34	km
Max. Source-Class I Distance:	67.58	km
Plume-Source-Observer Angle:	11.25	degrees
Stability:	4	
Wind Speed:	2.5	m/s

RESULTS

Asterisks (*) Indicate Plume Impacts that Exceed Screening Criteria

Maximum Visual Impacts INSIDE Class II Area

Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Background	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
Sky	10	147	67.6	22	2.00	0.657	0.05	0.010
Sky	140	147	67.6	22	2.00	0.148	0.05	-0.006
Terrain	10	84	46.3	84	2.28	0.942	0.05	0.009
Terrain	140	84	46.3	84	2.00	0.092	0.05	0.002

EXHIBIT B-2—CULTURAL RESOURCES

CULTURAL RESOURCE REVIEW FOR THE PROPOSED LA PAZ GENERATING FACILITY

Prepared for

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CULTURAL RESOURCE REVIEW FOR THE PROPOSED LA PAZ GENERATING FACILITY

STUDY GOALS AND METHODS

This cultural resources investigation was undertaken in compliance with the Arizona Corporation Commission's regulations regarding applications for CECs (R14-3-219). These regulations stipulate that CEC applications submitted to the Arizona Power Plant and Transmission Line Siting Committee describe "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."

This study provides an inventory and assessment of historic sites and structures and archaeological sites in the vicinity of the La Paz Generating Facility proposed by Allegheny. Components of this project that were considered include the following:

- A proposed generating facility site located about 75 miles west of downtown Phoenix
- A proposed 500kV transmission line interconnect approximately 1.75 miles long that would provide access to the regional transmission grid by linking the generating facility to the existing 500kV Palo Verde-Devers transmission line.
- A proposed pipeline lateral that would provide natural gas to the plant site from an existing EPNG pipeline approximately 5.5 miles away

This study is based on existing information regarding cultural resource surveys and recorded archaeological and historical sites within about 2 miles of the proposed facilities. Maps, records, and files were reviewed at the following agencies and institutions:

- State Historic Preservation Office (SHPO)
- Arizona State Museum (ASM)
- Department of Anthropology at Arizona State University (ASU)
- BLM State Office and Phoenix Field Office

SUMMARY

No major cultural features would be affected by the proposed project. No sites are located within the proposed generating facility footprint. There is high potential for avoiding or satisfactorily mitigating impacts on any sites encountered with minor project modifications to avoid impacts or with archaeological studies to recover important data prior to construction.

ENVIRONMENTAL AND CULTURAL BACKGROUND

Prehistoric Occupation

Human societies have lived in Arizona for at least 10,000 years and perhaps longer. The earliest groups lived by hunting large game and collecting native resources. Populations remained small and dispersed in this long time span, known as the Paleoindian and Archaic periods (Haury 1975). Excavations at Ventana

Cave, located southeast of the project area, provided unique stratigraphic evidence for these early periods in southwestern Arizona. Recent archaeological fieldwork has provided more information on the late Archaic period. Temporally and culturally diagnostic projectile points that include San Pedro, Amargosa, and Elko styles were found along Centennial Wash in the Harquahala Valley (Bostwick 1988; Stone 1986). Excavations revealed that most sites were surface finds with little evidence of sustained occupation. These sites nonetheless demonstrate that hunting and gathering peoples did utilize the resources of the desert areas in west-central Arizona for thousands of years.

Several centuries Before the Common Era (BCE), depending on the locality, some occupants of the desert began to grow their food, and soon many people had adopted agriculture as a way of life. They raised corn, beans, squash, cotton, and other crops along the fertile drainages where sufficient moisture was available. The regional population began to grow larger, and shortly thereafter large, permanent villages appeared. Known as the Hohokam, these native farmers of central Arizona are famous for constructing some of the most sophisticated irrigation systems in the New World periods (Doyel 1991). Villages along the Gila River extended west as far as Gila Bend. Farther west, other groups of people, known as the Patayan, were farming along the lower Colorado River Valley. Excavations in the Painted Rocks Reservoir near Gila Bend recorded both Hohokam and Patayan sites (Doyel 2000; Wasley and Johnson 1965).

By 800 BCE, some large villages along the Gila and Salt rivers had constructed large public monuments such as ball courts and platform mounds. For the more arid localities, such as west-central Arizona, there is little evidence for such developments. Archaeological sites found in these low, arid desert areas and in the uplands are usually scatters of surface artifacts that represent the remains of briefly used camps and hunting and gathering locations (Brown and Stone 1982). These areas were too arid to farm except in restricted situations where some agriculture could be practiced, such as Fourmile Wash below Flatiron Mountain (Sires 1989).

Historic Occupation

A number of native groups were present in the southwest and west-central Arizona in the early Historic period. Yuman-speaking Yavapais inhabited west-central Arizona north of the Salt and Gila rivers, O'odham groups lived south of the Gila River. A group that came to be known as the Maricopa lived along the lower Gila and Colorado River valleys. Some Maricopa moved east up the Gila River to join the Akimel O'odham (Pima) in the nineteenth century. Apache bands inhabited the mountains northeast of Phoenix. Early in the Historic period, these groups were involved in complex relationships that included trade, slave raiding, and warfare (Doyel 1989).

Yavapai

Gifford (1932, 1936) and Schroeder (1974) compiled primary Yavapai ethnographies between the 1930s and the 1950s. More recent ethnographic studies have focused on the Fort McDowell Reservation community (Mariella 1983). Early historic accounts include those of an army physician at Fort Verde (Corbusier (1886), and observations made during General Crook's Indian campaign. Khera and Mariella (1983) and Stone (1987:31) have compiled summaries of historic and ethnographic research among the Yavapai.

Yavapais were often misidentified as Apaches, and were often referred to as Apache-Mojave, Mojave-Apache, or Apache-Yuman. These names likely reflect the similarities of the Yavapai and Apache, the practice of intermarriage between Yavapai and Apache, and recognition of the linguistic affiliation of the Yavapais with Yuman speakers to the west (such as the Mojaves).

In the historic era, Yavapai occupied a large, triangular territory from near Flagstaff in the north, southeast to the Globe vicinity, and west to Yuma. The population in the 1860s was estimated to be 1,500 to 2,000, but tribal oral history indicates this was greatly reduced from pre-contact levels by warfare and disease. Earlier population densities were probably low, and typical of hunting and gathering societies, although the Yavapai did farm some locations in the upland areas where streams or springs provided sufficient water. Tribal oral history indicates more farming than is usually attributed to Yavapai. After planting their gardens, the Yavapai often left the area to gather and hunt, returning later to harvest the mature crops.

The Yavapai followed a seasonal round of movement from lowland deserts to upland chaparral and woodlands to hunt and collect native resources and to tend fields. They were organized into local groups or "camps" of up to 10 related households that were organized into bands. The bands were organized into three or four subtribes. The southwestern subtribe, the Tolkapaya, was the closest Yavapai group to the present project area. They periodically traveled to the Colorado River to plant crops, and in the 1850s and 1860s, some families joined the Cocopah after Euro-Americans started to invade their territory (Khera and Mariella 1983:41).

In the 1800s, Yavapai were hostile to O'odham groups south of the Gila River, and the Hualapai located to the north between the Bill Williams and Colorado rivers. On occasion, Yavapai were also hostile towards the Tonto Apaches, and incidents of "wife-stealing" were reported. Relations with Apaches were generally cooperative, as they were with the lower Colorado River Valley Mojaves and Quechans, with whom the Yavapais traded frequently.

Hostilities among Yavapai and Euro-Americans began with the discovery of gold near Prescott in the 1860s. Some Yavapai moved to the Colorado River Indian Reservation, but conflict intensified in the late 1860s. By 1871, the U.S. Army had confined about 1,000 Yavapai to the military reservation at Camp Date Creek. By 1873, the Yavapai were defeated, with a loss of 15 to 30 percent of the population. The surviving Yavapai were concentrated at Camp Verde, and in 1874 they were marched to the San Carlos Reservation where they lived with Apaches for 25 years. A few hundred Yavapais apparently escaped this incarceration and worked as laborers in the mines in the Castle Dome Mountains (Bean and Vane 1978:5-70).

By 1900, many Yavapai had returned to their homeland along the Verde River, and only a few hundred remained at San Carlos. The Fort McDowell Reservation was established on the lower Verde River in 1903. A 40-acre parcel also was set aside for the Yavapais near Camp Verde in 1910, and through expansions in 1914, 1916, and in the 1950s, the parcel now totals 635 acres. In 1956, a 75-acre reservation established near Prescott in 1935 was enlarged by 1,320 acres.

Today, there are about 800 enrolled members on the 39-square-mile Fort McDowell Reservation. About 1,180 enrolled members live on the Camp Verde Reservation parcels that aggregate to only slightly more than 1 square mile, and about 130 enrolled members reside on the 2.2-square-mile Yavapai-Prescott Reservation (Schell 1993).

Maricopa

When Europeans first arrived in the area, the Maricopas resided in the Gila River valley south and east of the proposed project site (Stein 1981). Spier (1933) conducted the basic ethnographic research of the Maricopas, and subsequent research was undertaken for the Indian Claims Commission (Fontana 1958; Hackenberg and Fontana 1974). Other researchers have investigated the confusing origin of the Maricopas (Bean and Vane 1978; Dobyns and others 1963; Ezell 1963; Harwell and Kelly 1983).

Spanish accounts are limited and inconsistent, but about 10 Yuman-speaking groups were named along the lower Colorado and lower Gila Rivers. Two groups formed a powerful north-south alliance, the Quechan (also known as Yuma) near the confluence of the Gila and Colorado rivers, and the Mojave who lived farther upstream along the Colorado River.

Numerous other smaller groups formed an east-west alliance. From the Colorado River delta, these groups included the Cocopahs, Halyikwamis, and the Kohuana, all of whom lived south of the Quechan, and the Halchidoma, who were situated between the Quechan and Mojave. Allies along the lower Gila River included the Kaveltcadoms, and upriver the Cocomaricopas and the Opas. Some researchers have concluded that Halchidoma, Kaveltcadom, Cocomaricopa, and Opa may have been geographical units of a single cultural group referred to as the Panya. Their population may have been about 5,000 in the 1700s. They lived in dispersed settlements *(rancherias)* similar to other nearby Yuman-speaking groups. They hunted, gathered wild plant foods, and fished, and also farmed using over-bank and floodwater techniques.

The name "Cocomaricopa" may be a Spanish transliteration of the O'odham name for people near Gila Bend *Kokomalik Aapap,* which means "friendly enemies. The O'odham were enemies of the two strongest Yuman groups, the Quechan and Mojave. Kokomalik refers to the Gila Bend Mountains. "Maricopa" may be derived from the Spanish shortening the O'odham name for the "friendly enemies of the Gila Bend Mountain area." Alternatively "Maricopa" may have evolved from the Spanish word "mariposa," or butterfly, used to describe these brightly painted Indians.

Maricopa was first applied in about 1839 to an amalgam of Panya groups who had absorbed the Kohuana and Halyikwamai. They had been driven from the lower Colorado and lower Gila River valleys by the Mojave and Quechan, perhaps stimulated by the coming of mountain men in search of furs or new markets for slaves in Mexico. The Panya regrouped in near the Akimel O'odham on the Gila River above its confluence with the Salt River, where they became known collectively as the Maricopa. The Halchidoma fled to Sonora for several years before returning to the Gila Valley to join their relatives. The Maricopas adopted aspects of Hispanic culture, including cattle, horses, mules, wheat, and possibly barley. Some Maricopas spoke Spanish well, serving as interpreters for the Akimel O'odham (Harwell and Kelly 1983:75).

In the 1840s, U.S. Army battalions traveling to California purchased food, especially wheat, from the Akimel O'odham and Maricopa villages (Doyel 1989). After the discovery of gold in California, about 60,000 "Forty-niners" crossed Arizona along this trail, creating a huge market for the Gila River farmers, who raised and sold three crops of wheat in the summer of 1849. In the 1850s, travelers on stage lines, including the Butterfield Stage, also took advantage of the "roadside groceries" offered by the friendly Akimel O'odham and Maricopa Indians.

In 1859 the federal government rewarded the Akimel O'odham and Maricopa by setting aside the first reservation in Arizona for their use. These groups joined U.S. Army troops in fighting their common enemies, the Apaches and Yavapai, but they were still ill-treated. American farmers settled on the Gila River in the Florence and Safford areas upstream and built their own irrigation canals. The Americans diverted so much of the river that by 1871 the Akimel O'odham and Maricopa fields were dry. The natives refer to this period as the "years of famine." Some Akimel O'odham and Maricopa moved north to the Salt River, where a reservation was established in 1879, and others moved to the confluence of the Salt and Gila rivers.

Today, the Maricopas reside primarily in two communities. There are about 5,400 enrolled members at the 87-square-mile Salt River Reservation, of which about 100 are Maricopa (who designate themselves as Halchidhomas) near Lehi. There are about 11,600 enrolled tribal members on the 583-square-mile Gila

River Reservation, of which about 600 are Maricopas, concentrated in the Laveen area in the northwestern corner of the reservation (Schell 1993).

Euro-Americans

Euro-Americans established ranches near the current project area in the late nineteenth and early twentieth centuries. E.H. Winters owned a ranch from 1885 to 1925, and was later memorialized when the town of Wintersburg was established near a well on the ranch. Wintersburg warranted a post office between 1930 and 1941, and a post office was established in Tonopah in 1934. There was a flurry of homesteading in the Palo Verde Hills area between the 1920s and the mid-1940s. The earliest of these were World War I veterans who had hopes of receiving government-sponsored aid for irrigation projects. Most attempts to rely on floodwater farming and wells failed. Some attempts at homesteading were fraudulent schemes to acquire lands for speculation (Stein 1981). Most homesteaders who managed to obtain patents left after establishing their claims. Historic remains of early farming and ranching attempts are relatively abundant on the plains around the Palo Verde Hills. They usually consist of a concrete house foundation slab, an abandoned dry well, animal pens, and scattered trash (Trott 1974).

PRIOR CULTURAL RESOURCE SURVEYS

The Granite Reef Aqueduct, a component of the CAP, generated the most extensive archaeological investigations in western Arizona (Figure B-2.1 [Due to the sensitive nature of archaeological resources this figure is not included for public distribution.]). The extensive fieldwork required coverage of an area exceeding 34,000 acres, which was divided into units, known as reaches, that facilitated the administration of the construction (Brown and Stone 1982). Since so little actual fieldwork had been conducted within the project area, the study area was extended several miles to the west to capture information resulting from this project. It was felt that expanding the study baseline would assist in gauging the site types present and overall potential for significant cultural resources in the current project area.

In 1968, Prescott College surveyed the original route for the aqueduct from the Colorado River to the Agua Fria River. No archaeological sites were located. In 1969, ASU surveyed parts of the aqueduct between the Agua Fria and Gila rivers and recorded 11 Hohokam-related sites (Table B-2.1). In 1972, the Bureau of Reclamation (Reclamation) contracted with ASM to survey the Granite Reef Aqueduct. In total, 32 sites were recorded, nine of which are in the Harquahala Valley (Brown and Stone 1982).

Two reaches extend into the current project area, the eastern end of Reach 4, and Reach 5A. The Arizona State Museum and the BLM surveyed Reach 4, locating four sites. Later, Reach 4 was resurveyed by ASU, which recorded 22 field loci and 200 isolated artifacts (Dobbins 1979). Due to the high artifact density, most of these loci were combined into one site, AZ S:7:13 (ASU). Reach 5A, along with other surveys, located 12 sites and some isolated artifacts.

Other surveys within the current project area include the West Coast/Mid-Continent pipeline project survey for EPNG by ASM. This survey consisted of nine 10-acre plots; no sites were recorded in the research areas (Lensink 1976).

In 1978, the Museum of Northern Arizona (MNA) conducted a sample survey for alternate transmission line routes for the Arizona portion of the Palo Verde-Devers 500kV transmission line. Documents are not available to document the scope of the survey, but two sites, AZ S:11:3 (ASM) and AZ S:11:5 (ASM), were identified (Berry 1978).

In 1982, WESTEC Services, Inc. was contracted by SCE to complete a cultural resource inventory and management program for a proposed 500kV transmission line ROW. A total of 288 miles of 400-foot-wide corridor from the Palo Verde Nuclear Generating Station to the Devers Substation (near Palm Springs California) was surveyed. Divided into California and Arizona segments, more than 390 cultural resources were recorded that included 231 isolated artifact occurrences and 159 sites within the Arizona portion. Seven of the 159 sites are within the current project area, with two sites AZ S:7:23 (ASM) and AZ S:7:25 (ASM) eligible for National Register status (Carrico and Quillen 1982).

In 1980, ASU was contracted by Provident Energy Company to complete a cultural resource inventory for a crude oil pipeline between Kingman and Mobile, Arizona. Of the 2,509 miles surveyed, no sites were found within the current project area (Henss 1983).

Archaeological Consulting Services (ACS) conducted a cultural resource survey of 17 acres along a 15-meter ROW for Arizona Public Service Company that located no sites (Effland 1985). Also in 1985, New Mexico State University conducted a survey for BLM for the All-American Pipeline Company prior to construction of a pipeline. In total, 5,818 acres were surveyed, with three sites identified in the current project area; these include sites AZ S:7:39 (ASM), AZ S:7:40 (ASM), and AZ S:7:42 (ASM) (Batcho 1985).

In 1987, U.S. Telecom contracted Dames & Moore to conduct a cultural resource survey for a fiber optic cable ROW. A total of 862 acres were surveyed and 12 new sites were identified. No sites were recorded within the current project area (O'Brian and others 1987).

In 1992, an archaeological survey of the Yuma Lateral Expansion Project in La Paz County was initiated for a natural gas pipeline ROW from the Wenden Compressor Station to the U.S- Mexican border. No sites were located (McQuestion and others 1992).

TABLE B-2.1
PRIOR PROJECTS NEAR THE PROPOSED LA PAZ GENERATING FACILITY

Project Name	Scope	Sites in area	Reference
El Paso Natural Gas Company West Coast/Mid-Continent Pipeline Project (ASM 1976-006)	90 acres (10-acre plots)	None	Lensink 1976
Granite Reef Aqueduct Reach 5A (1976)	2,150 acres	AZ S:7:7 (ASU) AZ S:7:8 (ASU) AZ S:7:9 (ASU) AZ S:7:10 (ASU) AZ S:7:11 (ASU)	Brown 1976a and b, Brown and Stone 1982
Sample Survey of the Palo Verde to Devers Transmission Line (MNA-A76-47)	Unknown	AZ S:11:3 (ASM) AZ S:11:5 (ASM)	Berry 1978
Granite Reef Aqueduct Reach 4 (ASM 1972-5; ASM 1979-118; ASU 24-79)	230 acres	AZ S:7:13 (ASM)	Dobbins 1979, Stone 1979, Brown and Stone 1982
Southern California Edison Palo Verde to Devers Transmission line (Arizona portion) (ASM 1981-159)	110 miles x 200 feet	AZ S:7:18 (ASM) AZ S:7:19 (ASM) AZ S:7:20 (ASM) AZ S:7:21 (ASM) AZ S:7:22 (ASM) AZ S:7:23 (ASM) AZ S:7:24 (ASM) AZ S:7:25 (ASM)	Carrico and Quillen 1982

TABLE B-2.1 PRIOR PROJECTS NEAR THE PROPOSED LA PAZ GENERATING FACILITY			
Project Name	**Scope**	**Sites in area**	**Reference**
Kingman to Mobile Pipeline Corridor, (ASU 20-80)	207 miles x 100 feet (2,509 acres)	None	Henss 1983
All American pipeline Survey (ASM 1985-26, BLM 9-58/10-182)	240 miles x 200 feet (5,818 acres)	AZ S:7:39 (ASM) AZ S:7:40 (ASM) AZ S:7:42 (ASM)	Batcho 1985; Higgins and Brunson 1985
Arizona Public Service Harquahala Valley Distribution Line (ACS 10-155)	16.95 acres	None	Effland 1985
U.S. Telecom Fiber Optic Cable Project from San Timoteo to Socono (Arizona segment) (ASM 1987-222)	862 acres	None	O'Brian and others 1987
Yuma Lateral Expansion Project (ASM 1992-262; SHPO 138-I)	2105 acres surveyed	None	McQuestion, et. al. 1992; Torres and Manygoats 1992
North-South Transfer Pipeline (ASM 1994-202) Dames & Moore	98 square miles	None	Rogge, Boloyan, and Darrington 1994
ADOT Avenue 75E/I-10 Disposal Parcel (ASM 1996-93)	75 acres	None	Stone, B. 1996
Proposed road alignment in Harquahala Valley (ACS 00-79A)	11 acres	None	Crownover 2000
BLM Littlehorn Planning Unit – Sample Survey Transects 64 and 65	Unknown	AZ S:7:2 (BLM) AZ S:7:3 (BLM)	Bennett nd
BLM 9-77	Unknown	None	BLM PFO Files nd
BLM Sample Surveys – Survey Units 396, 414 and 440.	120 acres	None	BLM PFO Files nd

In 1994, Dames & Moore conducted a records search for the construction of a pipeline by EPNG that would transfer natural gas among existing pipelines across the northern and southern parts of the state. The inventory covered 98 miles near EPNG's Havasu Crossover Pipeline built in 1950 (Rogge, Boloyan, and Darrington 1994).

No sites were identified in a 75-acre survey by Archaeological Research Services (ARS) for ADOT's Avenue 75E/Interstate 10 Disposal Parcel (Stone 1996).

In 2000, Archaeological Consulting Services, Ltd. conducted a cultural resources survey of 1.5 miles (11 acres) of new right of way north of Centennial Wash in the Harquahala Valley. No archaeological sites were identified (Crownover 2000).

Three BLM surveys were undertaken within the current project area. Sample Survey 9-77 has no documentation other than a map location. Another group of sample surveys, SU396, SU414, and SU440, are also located on BLM maps, but supporting documentation is unavailable. Survey Transects 64 and 65 were conducted as sample surveys for the Littlehorn Planning Unit. The survey resulted in the location of two lithic scatters, AZ S:7:2 (BLM) and AZ S:7:3 (BLM). Both of these sites are within the current project area (Bennett nd).

INVENTORY OF PREVIOUSLY RECORDED CULTURAL RESOURCES

Twenty-nine sites have been identified within the review area (Table B-2.2). No sites are located within the proposed project footprint.

About 30 percent of the sites contain aboriginal features without associated artifacts (Table B-2.3). Features include petroglyphs, rock rings, rock enclosures, trails, intaglios, rock shelters, and hearths. The most common feature types are rock rings that may be the remains of temporary shelters, and rock enclosures and trails. The rock enclosures are located on the volcanic hills that are common in the area and may represent hunting blinds. Trails embedded in desert pavement are a common feature type in western Arizona, but some trails are different. Trails recorded in the Palo Verde area are unusually located on hills, instead of in lower desert areas. It has been suggested that these "summit trails" and the associated rock enclosures and petroglyphs may be ceremonial modifications of the hills that are, in effect, "natural pyramids" (Stein 1981; Personal communication, Boma Johnson, Former BLM Yuma Field Office archaeologist, 1999).

About 57 percent of the sites are combinations of aboriginal feature types and artifacts. Almost half are scatters of flaked and ground stone artifacts, sherds, and fire-cracked rock; the latter represent hearth remnants likely used to process collected resources such as mesquite beans. Rock rings and trails with associated artifacts and other features also are common. Petroglyphs are elements of three of these sites. Some artifacts and features may be buried at these sites, but often the sites have been deflated by erosion. Some hearths or pit features may be intact, but extensive buried components are unlikely.

About 10 percent of the sites date to the historic period. Remains of post-World War I homesteads are the most common site type. Other sites present include a farm complex, a mine, and less substantial sites such as temporary camps, ramadas, a well, and trash accumulations.

TABLE B-2.2
PREVIOUSLY RECORDED SITES NEAR THE PROPOSED LA PAZ GENERATING FACILITY

Site Number	Description	Status	Reference
AZ S:7:1 (ASM)	Ceramic/ lithic scatter	Unknown	Kemrer and others 1972
AZ S:7:2 (ASM)	Lithic scatter	Unknown	Kemrer and others 1972
AZ S:7:2 (BLM)	Lithic scatter	Unknown	Bennett nd
AZ S:7:3 (ASM)	Campsite and lithic scatter	Unknown	Kemrer and others 1972
AZ S:7:3 (BLM)	Lithic scatter	Unknown	Bennett nd
AZ S:7:4 (ASM)	Lithic groundstone scatter	Unknown	Kemrer and others 1972
AZ S:7:5 (ASM)	Prehistoric lithic/ groundstone scatter	Ineligible	Kemrer and others 1972, Connors 1976
AZ S:7:6 (ASM)	House	Unknown	Kemrer and others 1972
AZ S:7:8 (ASU)	Circular cobble alignment w/lithics	Unknown	Brown 1976, Connors 1976
AZ S:7:9 (ASM)	Lithic scatter	Unknown	Carrico and Quillen 1982
AZ S:7:9 (ASU)	Circular cobble alignments	Unknown	Brown 1976
AZ S:7:10 (ASM)	Quarry with a small lithic scatter	Unknown	Brown 1980
AZ S:7:10 (ASU)	Ceramic & lithic scatter	Unknown	Brown 1976, Connors 1976
AZ S:7:11 (ASU)	Rock ring, possible wind break w/ small artifact scatter	Unknown	Brown 1976, Connors, 1976
AZ S:7:13 (ASU)	Ceramic and Lithic scatters	Unknown	Dobbins 1979
AZ S:7:18 (ASM)	Lithic scatter	Unknown	Carrico and Quillen 1982
AZ S:7:19 (ASM)	Prehistoric temporary Camp	Ineligible	Carrico and Quillen 1982
AZ S:7:20 (ASM)	Prehistoric temporary camp	Ineligible	Carrico and Quillen 1982

TABLE B-2.2 PREVIOUSLY RECORDED SITES NEAR THE PROPOSED LA PAZ GENERATING FACILITY			
Site Number	**Description**	**Status**	**Reference**
AZ S:7:21 (ASM)	Lithic Scatter	Ineligible	Carrico and Quillen 1982
AZ S:7:22 (ASM)	Prehistoric temporary camp	Ineligible	Carrico and Quillen 1982
AZ S:7:23 (ASM)	Prehistoric temporary camp	Eligible	Carrico and Quillen 1982
AZ S:7:24 (ASM)	Historic trash dump	Ineligible	Carrico and Quillen 1982
AZ S:7:25 (ASM)	Prehistoric temporary camp	Eligible	Carrico and Quillen 1982
AZ S:7:39 (ASM)	Lithic scatter	Unknown	Batcho 1985
AZ S:7:40 (ASM)	Trail segments	Unknown	Batcho 1985
AZ S:7:42 (ASM)	Trail segment	Unknown	Batcho 1985
AZ S:11:1 (ASM)	Cave Site	Unknown	Fritz 1975
AZ S:11:3 (ASM) NA 14,787 AZ S:11:5 (BLM)	Ceramic scatter	Unknown	Berry 1978
AZ S:11:5 (ASM) NA 14,786 AZ S:11:4 (BLM)	Sherd and lithic scatter	Unknown	Berry 1978

Three places are associated with American Indian cultural traditions (Bean and Vane 1978). One of these is in the Palo Verde Hills west of the PVNGS. Native people have identified this as a traditional place where wild food resources were collected. A second area consists of six volcanic hills near Jagow Well at the southeastern end of the Palo Verde Hills. These hills are associated with petroglyphs, interconnecting trails, a rock blind, and an intaglio figure atop one hill. Yavapai identify this place as a "mountain sounds like a drum," and consider the complex to be a dangerous place of spiritual power. The Tohono O'odham, Hia-Ced O'odham, and Cocopah also may have traditional cultural associations with this place. In 1980 a draft nomination for the National Register of Historic Places was prepared for this complex, but apparently no action was taken. The 2.5-square-mile area encompassed by this Jagow Well/Palo Verde Hills District is on the north side of the Palo Verde-Devers transmission line that would be paralleled by a new line. A third traditional cultural area was only broadly defined as the plains between the Palo Verde Hills and the Gila Bend Mountains that some Maricopa identified as a ceremonial zone.

General Land Office Plats

General Land Office (GLO) plats for T2N, R10, 11 and 12W, and T3N, R10, 11 and 12W, were located at the Arizona State Office of the BLM to identify any cultural resources within the current project area.

TABLE B-2.3 SUMMARY OF SITE TYPES NEAR THE PROPOSED LA PAZ GENERATING FACILITY							
Ceramic Scatter	**Lithic Scatter**	**Ceramic and Lithic Scatter**	**Prehistoric Temporary Camp**	**Historic Trash Scatter**	**Historic Structure**	**Rock/Cobble Alignments**	**Other**
AZ S:11:3 (ASM)	AZ S:7:2 (ASM)	AZ S:7:1 (ASM)	AZ S:7:3 (ASM)	AZ S:7:24 (ASM)	AZ S:7:6 (ASM)	AZ S:7:8 (ASU)	AZ S:7:10 (ASM)
	AZ S:7:2 (BLM)	AZ S:7:10 (ASU)	AZ S:7:19 (ASM)			AZ S:7:9 (ASU)	AZ S:7:40 (ASM)
	AZ S:7:3 (BLM)	AZ S:7:13 (ASU)	AZ S:7:20 (ASM)			AZ S:7:11 (ASU)	AZ S:7:42 (ASM)
	AZ S:7:4 (ASM)	AZ S:11:5 (ASM)	AZ S:7:22 (ASM)				AZ S:11:1 (ASM)

TABLE B-2.3 SUMMARY OF SITE TYPES NEAR THE PROPOSED LA PAZ GENERATING FACILITY							
Ceramic Scatter	**Lithic Scatter**	**Ceramic and Lithic Scatter**	**Prehistoric Temporary Camp**	**Historic Trash Scatter**	**Historic Structure**	**Rock/Cobble Alignments**	**Other**
	AZ S:7:5 (ASM)		AZ S:7:23 (ASM)				
	AZ S:7:9 (ASM)		AZ S:7:25 (ASM)				
	AZ S:7:18 (ASM)						
	AZ S:7:21 (ASM)						
	AZ S:7:39 (ASM)						
PREHISTORIC/ARCHAEOLOGICAL SITES = 27 (90 percent of TOTAL sites in Class 1 Research Area) Artifact Scatters = 17 (57 percent) Other = 10 (33 percent)							
HISTORIC SITES/STRUCTURES = 2 (10 percent)							

T2N, R10W was surveyed in 1914 and filed in 1916. Included within the project area include sections 5-8, 17-20, and 29-32. A dry well was located on the northern portion of Section 5. T2N, R11W was surveyed in 1934 and filed in 1936. Sections 1-16, 21-28, and 33-36 were reviewed. Six unnamed dirt and country roads were identified that in the area, and three historic houses are shown in Sections 1 and 2. T2N, R12W was surveyed in 1955 and filed in 1956. The GLO plat only shows a map of Section 2. A buried pipeline is shown in the southern portion of the section. Since Section 2 is the only section shown on the GLO plat, Sections 11, 12 and 01 could not be reviewed.

T3N, R10W was surveyed in 1915 and filed in 1916. Sections 30, 29, 31, and 32 were reviewed for this project. An unnamed road is shown in the northeastern corner of section 29. T3N, R11W was surveyed in 1914 and filed in 1916. Sections 25-36 were reviewed. A hard surface road runs through Sections 30 and 32, and a country road is shown in the southwestern portion of Section 31. T3N, R12W was surveyed in 1923 and filed in 1924. Sections 26, 25, 35, and 36 were reviewed. An unnamed road crosses Sections 25 and 26 towards Hubbard's House and Well in section 19, the latter located outside of the present project area.

POTENTIAL FOR SIGNIFICANT CULTURAL RESOURCES

The information compiled herein provides a basis for gauging the potential for significant archaeological and historical sites to be present in the current project area. The studies for the CAP/Granite Reef Aqueduct and related facilities recorded a variety of archaeological sites, most of which appear to date from about 1,000 years ago. Some of these are likely associated with mesquite bean gathering activities, but some sites may reflect, hunting, gathering or ceremonial activities that could date either from the early Archaic era or to the early historic period. The few historic sites are associated with homesteading activities in the 1920s and 1930s.

Many of the Native archaeological sites were found along major washes or clustered around the volcanic hills in the area. The proposed project area site lacks both of these topographic features. No archaeological or historical sites have been recorded within the proposed generating facility site, and

since the entire parcel has been subjected to irrigation agriculture, the potential is low to find any intact archaeological or historical resources.

About half of the corridor for the proposed pipeline lateral has been farmed. Cultural resource surveys have been conducted for a flood control project near the junction of this corridor and the interstate pipeline, and along the pipeline corridor itself. Several archaeological sites have been recorded in this area near Centennial Wash, suggesting some potential for the presence of archaeological sites in the vicinity of the southern end of the proposed pipeline lateral corridor. However, site density is not high, site size is not large, and the extent of ground disturbance for installation of the pipeline lateral would be limited to a narrow ROW.

About half of the proposed transmission line interconnect would cross developed agricultural land. Two historical sites are located west of this area. One is a well with associated trash, and another may be the remains of a 1930s or 1940s camp or temporary residence. Surveys were conducted within the BLM utility corridor prior to the construction of the Palo Verde-Devers line and for the once proposed but never built Palo Verde-Devers No. 2 line. Of the 27 archaeological sites present along the transmission line, 21 of these have no significant archaeological values. All can be avoided as the sites are located west of the current project area.

Investigations of traditional cultural places have identified the Palo Verde Hills as a sensitive area. The proposed transmission line interconnect would parallel the existing Palo Verde-Devers line past this area. Much of this area has been subdivided into 40-acre lots, roadways have been added, and houses and mobile homes have been installed on some lots. The incremental impacts of a second transmission line are unlikely to be significant against this background of previous development. The plains between the Palo Verde Hills and the Gila Bend Mountains also were identified as a traditional Maricopa ceremonial area, but the available information provides no details about the nature of the traditional cultural values associated with this region.

GLO plats were reviewed to gauge the potential for unrecorded historic buildings and structures. The GLO first surveyed the townships in which the proposed project is located in 1914. Few cultural features other than unnamed roads are shown on the plats. A road is labeled between Phoenix and Harrisburg. Historic homes are depicted in Sections 1 and 2 of T2N, R11W. Named features include Hubbard's House and Well in Section 19 of T3N, R12W. Both of these are located outside the proposed project area.

The proposed transmission line interconnect would cross the alignment of the Phoenix-Harrisburg road but the modern Buckeye-Salome Road may have eliminated any remnants of this early road. Two other minor unnamed road alignments may be crossed near the eastern end of the proposed transmission line interconnect, and the proposed pipeline lateral may cross one or two others. In sum, no major cultural features depicted on the plats would be affected by the proposed project.

CONCLUSION

A cultural resources review of four institutions determined that 29 archaeological sites have been identified within the review area. Over half of these contain Native American feature types and artifacts. Prehistoric sites are not common, and those present are small in size, except for those located in especially favorable contexts that do not occur within the project area. Artifacts and features may occur at any sites encountered, but the presence of extensive buried components is highly unlikely. Fewer than 10 percent of the sites date to the historic period, and there is little evidence for sites in the area that pre-date 1914. No major cultural features would be affected by the proposed project.

No sites are located within the proposed generating facility footprint. About one-half of the corridors for both the proposed pipeline lateral and the proposed transmission line interconnect would cross agricultural lands. Site visibility would be low in these areas and intact cultural remains would not be expected. There is high potential for avoiding or satisfactorily mitigating impacts on any sites encountered with minor project modifications to avoid impacts or with archaeological studies to recover important data prior to construction.

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EXHIBIT B-3 WATER SUPPLY REPORT

WATER SUPPLY REPORT FOR

THE LA PAZ GENERATING FACILITY

Prepared for

Allegheny Energy Supply Company, LLC

URS Job No. E1-00001722.03

June 19, 2001

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WATER SUPPLY REPORT FOR THE LA PAZ GENERATING FACILITY

INTRODUCTION

Allegheny Energy Supply Company, LLC (Allegheny) is proposing to construct the La Paz Generating Facility in the Harquahala Valley, approximately 75 miles west of Phoenix, Arizona. The project location is shown on Figure B-3.1. This report presents a regional overview of groundwater conditions in the Harquahala Valley and groundwater conditions in the immediate vicinity of the proposed La Paz Generating Facility. The results of a numerical groundwater flow model used to evaluate the impact of groundwater pumpage for the La Paz Generating Facility are also included and discussed.

The proposed power facility will be a natural gas-fired, combined-cycle electric generating facility capable of producing a base load of 1,080 megawatts (MW). It is estimated that the facility will require a maximum of 6,500 acre-feet per year (af/yr) water supply. Studies conducted as part of this water supply investigation, along with studies conducted for the construction of the nearby water recharge facility, show that the generating facility would have minimal impact on the aquifer over the life of the project. Water supplies for the facility are immediately available from the underlying aquifer, which is within the Harquahala Basin. The lands also may be irrigated with water from the Central Arizona Project (CAP) to maintain their existing agricultural uses.

Property Location

The La Paz Generating Facility property consists of 80 acres of undeveloped desert land located approximately 0.75 mile south of Interstate 10 and on the west side of Exit 69, Avenue 75E. Two-thirds of the Harquahala Valley lies within Maricopa County; the northwestern third, which includes the La Paz Generating Facility property, lies within La Paz County. The cadastral location of the property is the southern half of Section 35, T3N, R11W, of the Gila and Salt River baseline and meridian.

Allegheny is in the process of purchasing the land in the southwest quarter of Section 1, T2N, R11W, and plans to acquire the rest of the land in Section 1 through a land exchange with the Bureau of Land Management (BLM). This property would be used for the production well field and a temporary staging area for construction equipment during construction of the facility.

Purpose and Scope

This water supply report contains hydrogeologic information to support the application for the Certificate of Environmental Compatibility for the La Paz Generating Facility. This report includes a discussion of the regional and site-specific groundwater conditions, including groundwater quality, pumpage history of the Harquahala Valley, projected water supply needs and acquired irrigation grandfathered groundwater rights, and the proposed production well field.

Sources of Information

Much of the information compiled and presented in this report was obtained from previous investigations and reports prepared by HydroSystems, Inc. (1999a, 1999b, 2000). HydroSystems, Inc. was contracted by the Vidler Water Company to evaluate the feasibility and effects of constructing an underground storage facility to recharge CAP water to the aquifer. The completed and permitted Vidler Recharge Facility is located approximately 1 mile west of the La Paz Generating Facility. Information also was obtained from two regional studies of the Harquahala Valley: a recent investigation by Errol L. Montgomery &

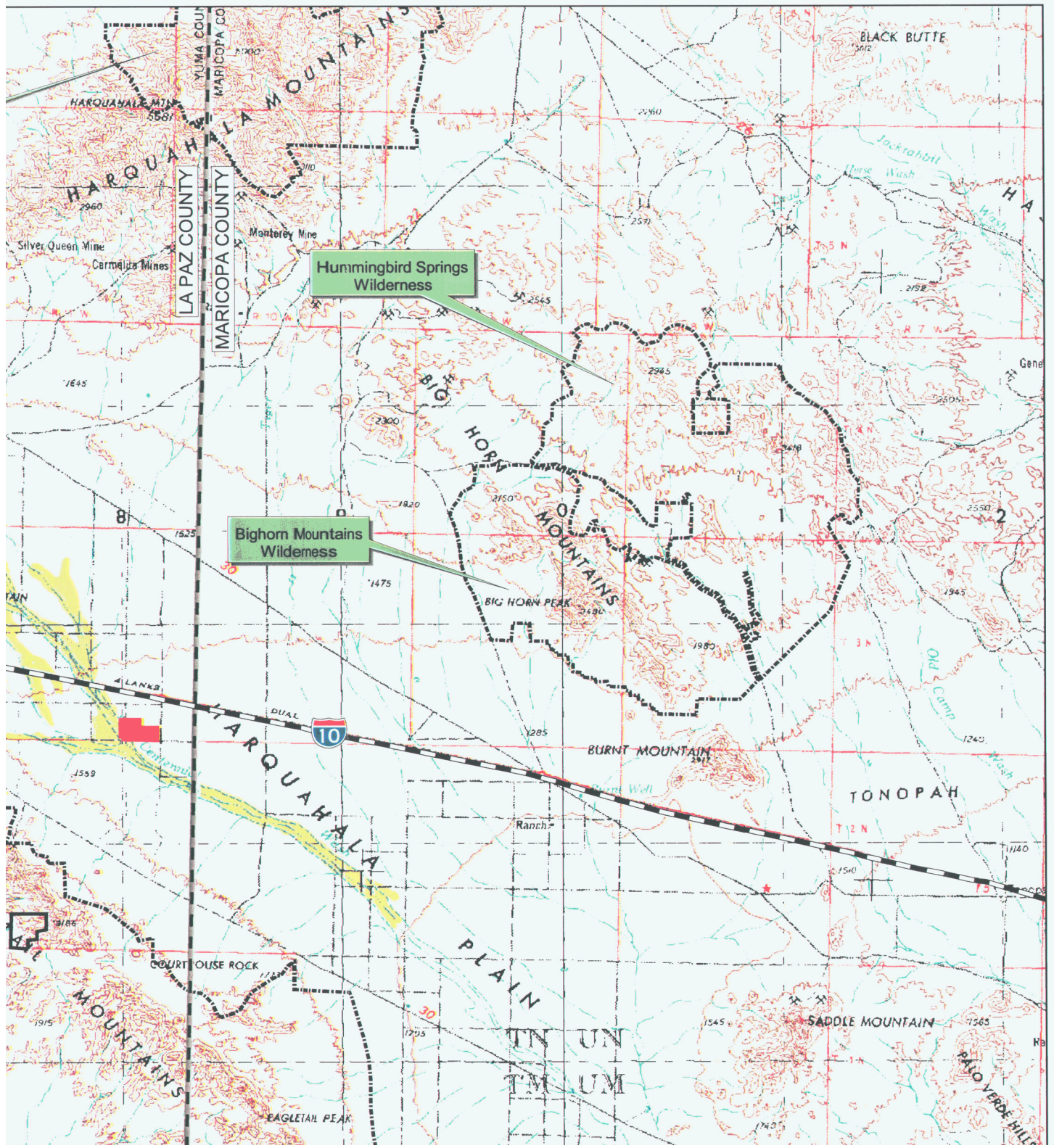


Figure B-3.1
Project Site Location Map

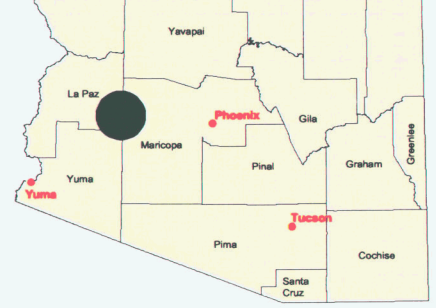
La Paz Generating Facility

Allegheny Energy Supply
an Allegheny Energy company

Legend

- Generating Facility Site
- Wilderness Area

General Project Location In Arizona



Sources:
USGS, Phoenix 1x2 Degree Quadrangle, Revised 1969.

Associates, Inc. for the Central Arizona Water Conservation District (2001) and a report by Technical Consultants, Inc. for the Central Arizona Water Conservation District (1990). Well information presented in Table B-3.1 and water level data was obtained from the Arizona Department of Water Resources (ADWR).

Available published studies conducted in the Harquahala Valley include a geologic and hydrologic discussion by Metzger (1957), two hydrologic map reports produced by ADWR (Graf 1980; Hedley 1990), and a regional hydrologic study encompassing Arizona, California, and New Mexico (Freethey and Anderson 1986).

GROUNDWATER CONDITIONS

Hydrogeologic Setting

The La Paz Generating Facility will be located in the Harquahala groundwater basin, which encompasses approximately 850 square miles (Hedley 1990). The Harquahala groundwater basin is one of several basins located within the Basin and Range physiographic province, which includes the deserts of southern and western Arizona and is characterized by predominately northwest-trending mountains separated by elongated alluvial valleys. In the Harquahala basin, the valley floor is the down-dropped block bounded by the up-faulted mountain blocks. The surrounding mountains include the Harquahala and Big Horn mountains to the north, Saddle Mountain to the east, the Gila Bend and Eagletail mountains to the south, and the Little Harquahala Mountains to the west.

Centennial Wash, the major ephemeral stream in the Harquahala basin, flows from the northwestern corner of the basin through the valley to the southeast end between the Gila Bend Mountains and Saddle Mountain. Centennial Wash joins the Gila River approximately 16 miles southeast of the Harquahala basin. Tiger Wash, a smaller ephemeral stream and tributary to Centennial Wash, enters the Harquahala basin from the northeast, between the Harquahala and Big Horn mountains.

The Harquahala Mountains, located at the northern end of the basin, are one of several mountain ranges in Arizona known as metamorphic core complexes (Nations et al. 1981). Metamorphic core complexes consist of a Precambrian granite, gneiss, and/or schist core with outer layers of intensely sheared and metamorphosed sediments. Most metamorphic core complexes, including the Harquahala Mountains, are flanked by Paleozoic or Mesozoic sedimentary rocks, and are associated with Tertiary intrusions. The Little Harquahala Mountains also consist of Precambrian rock and Paleozoic and Mesozoic sedimentary sequences, which have been locally metamorphosed (HydroSystems, Inc. 1999b; Technical Consultants Inc. 1990). Tertiary volcanic rocks overlie Precambrian gneiss, schist, and granite in the Big Horn Mountains and along the eastern side of the Eagletail Mountains. Eroded sediments from these mountains are the primary source of the basin fill deposits. The basin fill sediments consist of interbedded lenses of gravel, sand, silt, and clay. Thin, local layers of lacustrine limestone, gypsum, and volcanics also are present.

In a regional overview of the Harquahala Valley, Technical Consultants, Inc. divides the basin fill sediments into three distinct lithologic units: Subunits 1, 2, and 3 (Technical Consultants, Inc. 1990). These units are similar in composition and hydraulic characteristics to the Upper Alluvial Unit (UAU), Middle Alluvial Unit (MAU), and Lower Alluvial Unit (LAU) of the East and West Salt River Valley sub-basins of the Phoenix Active Management Area (AMA). However, the contrasts between the coarse-grained units and the fine-grained units of the Harquahala basin are not as sharp as the Salt River Valley units (Technical Consultants Inc. 1990). Toward the margins of the basin, and in the area of the La Paz Generating Facility, the contact between the units becomes indistinguishable and the designation of the three units is no longer applicable.

TABLE B-3.1
KNOWN WELLS WITHIN 1 MILE OF THE LA PAZ GENERATING FACILITY

	Cadastral Location	ADWR Registration Number	Well Type	Water Use	Well Depth	Well Casing Depth	Well Casing Diameter	Well Owner	Depth to Groundwater	Comments	Date	Action
1	B-02-11 01CAA	55-579334	Monitor	Non-service	570	570	5	Vidler Water Company	420		04/16/2000	Well Completed
2	B-02-11 01CBA	55-501105	Exempt	Domestic				Casey, W.				
3	B-02-11 01CCB	55-579335	Monitor	Non-service	560	470	5	Vidler Water Company	420		04/14/2000	Well Completed
4	B-02-11 02BBB	55-603419	Non-exempt	Recovery	850	579	20	MBT Ranch	375	Same well as 55-614432?	05/17/1977	Well Completed
		55-614432	Non-exempt	Recovery	850	580	20	Az State Land Dept.			01/01/1977	Well Completed
5	B-02-11 02BBC	55-562959	Exploration	None	320			Water Resources Co.				
6	B-02-11 02DDD	55-562960	Exploration	None	320			Water Resources Co.				
7	B-03-10 31CBB	55-603422	Non-exempt	Irrigation	912	912	20	MBT Ranch	375	Same as well 55-614436?	01/25/1976	Well Completed
		55-614436	Non-exempt	Irrigation	912	912	20	Az State Land Dept,	375		01/01/1975	Well Completed
8	B-03-11 25ABB	55-085959	Exempt	Domestic				Simpson, G.				
9	B-03-11 34ABA	55-603424	Non-exempt	Irrigation	850	850	12	Vidler Water Company	390			
10	B-03-11 34BBB	55-603423	Non-exempt	Irrigation	855	855	20	Vidler Water Company	374		12/22/1975	Well Completed
11	B-03-11 34BCC	55-603420	Non-exempt	Irrigation	855	855	20	Vidler Water Company	396		09/16/1976	Well Completed
12	B-03-11 34CDC	55-562957	Exploration	None	300			Water Resources Co,			10/22/1997	Log Received
13	B-03-11 34DAA$_1$	55-633431	Exempt	Unused	392	392		Vidler Water Company			01/17/2001	Abandonment Report Received
14	B-03-11 34DAA$_2$	55-603425	Non-exempt	Domestic	590	590	10	Vidler Water Company	390		09/20/1975	Well Completed
15	B-03-11 34DDC	55-562958	Exploration	None	320			Water Resources Co,			10/22/1997	Log Received
16	B-03-11 35ACC	55-564182	Exploration	None	300			Vidler Water Company			10/22/1997	Log Received
17	B-03-11 36BAA	55-603426	Non-exempt	Irrigation	860	860	20	MBT Ranch	400	Same well as 55-614440?	09/01/1976	Well Completed
		55-614440	Non-exempt	Irrigation	860	597	20	Arizona State Land Dept.	387		01/01/1976	Well Completed
18	B-03-11 36BBB	55-603427	Non-exempt	Irrigation	915	915	20	MBT Ranch	380	Same well as 55-614438?	08/01/1975	Well Completed
		55-614438	Non-exempt	Irrigation	912	597	12	Arizona State Land Dept.	380		01/01/1975	Well Completed
19	B-03-11 36CBB	55-603421	Non-exempt	Irrigation	875	875	20	MBT Ranch	375	Same well as 55-614439?	02/01/1976	Well Completed

According to Technical Consultants, Inc., the uppermost unit, Subunit 1, consists of interbedded Quaternary gravel, sand, silty gravel, and silty sand (Technical Consultants, Inc. 1990). Subunit 1 ranges in thickness from 30 feet to more than 280 feet. Subunit 2 contains finer-grained sediments including silty clay, sandy clay, sandy silt, and silt (Technical Consultants, Inc. 1990). These sediments become finer toward the basin center. Thin layers of gypsum and lacustrine limestone are also present in Subunit 2. The thickness of Subunit 2 ranges from 0 feet to more than 775 feet, with the thickest portion found in the basin center (Technical Consultants, Inc. 1990).

Subunit 3, the lowermost lithologic unit, is composed of Tertiary sand, silty sand, silty gravel, and gravel with non-contiguous interbedded layers of volcanics (Technical Consultants, Inc. 1990). Subunit 3 ranges in thickness from 0 feet along the basin margins to more than 2,400 feet in the basin center (Technical Consultants, Inc. 1990). Because no wells completely penetrate Subunit 3, depth to bedrock in the center of the basin is not known. Along the basin margins where the subunits are thinner, well driller's logs indicate volcanic flow units, tuffs, and colluvial conglomerate, all of unknown thickness, beneath Subunit 3 (Technical Consultants, Inc. 1990).

The Technical Consultants, Inc. report also defines three hydrogeologic units: Hydrostratigraphic Unit 1, Hydrostratigraphic Unit 2, and Hydrostratigraphic Unit 3 (Technical Consultants, Inc. 1990). The three hydrogeologic units are equivalent to the similar lithologic units described above. Hydrostratigraphic Unit 1 (Subunit 1), the uppermost unit, is unsaturated with the exception of localized areas of perched water in the mid-to-southeastern portion of the basin (T1N and T2N). Hydrostratigraphic Unit 2, the finer-grained middle unit, is the main water-producing unit of the basin (Technical Consultants, Inc. 1990). Hydrostratigraphic Unit 3 is the thickest unit, composed of coarser-grained sediments. Although no pumping data exist for wells screened entirely in Unit 3, this unit reportedly yields large volumes of water to production wells (Technical Consultants, Inc. 1990). The surrounding mountains may contain small quantities of groundwater in fractures and joints but this is not considered to be part of the regional aquifer.

Aquifer parameters for the three hydrogeologic units were inferred by Technical Consultants, Inc. based on pump test analyses from other Arizona basins with similar lithologic characteristics. Hydrostratigraphic Unit 1 was assumed to have a hydraulic conductivity of approximately 10 feet per day (ft/day), porosity of 20 to 25 percent, specific yield of 15 to 20 percent, and an estimated transmissivity of 10,000 gallons per day per foot (gpd/ft) (Technical Consultants, Inc. 1990). However, as mentioned above, Hydrostratigraphic Unit 1 is unsaturated with the exception of localized perched zones and no wells are producing solely from a perched zone.

Based on the finer-grained sediments present in Hydrostratigraphic Unit 2, the hydraulic conductivity for this unit was inferred to be in the range of 1×10^{-1} to 1×10^{-3} ft/day, with a porosity of 35 to 45 percent, specific yield of 1 percent, and 100 gpd/ft or less for transmissivity (Technical Consultants, Inc. 1990). In order to model the effects of recharge from the Vidler Recharge Facility, HydroSystems, Inc. compiled data from 30 short-term pump tests and one long-term pump test of wells within the Harquahala basin. Transmissivity values from these data ranged from 4,000 to 115,000 gpd/ft with an average value of 53,000 gpd/ft. All of the wells in the pump tests were producing from Hydrostratigraphic Unit 2 (HydroSystems, Inc. 1999).

Estimated aquifer parameters for Hydrostratigraphic Unit 3 range from 10 to 100 ft/day for hydraulic conductivity, 20 to 25 percent porosity, specific yield of 20 percent, and a transmissivity of 10,000 to 100,000 gpd/ft (Technical Consultants, Inc. 1990).

Five well driller's logs were used to interpret the hydrogeology specific to the area beneath and around the La Paz Generating Facility. Three of the five wells are irrigation wells presently being used as monitor

wells are owned by Vidler Water Company (wells 5, 6, and 8). The remaining two wells are monitor wells installed in April 1999 by Allegheny (wells AE-1 and AE-2). The locations of the five wells are shown on Figure B-3.2. According to the well driller's logs from the three Vidler Water Company wells, the sediments from 10 feet below ground surface (bgs) to approximately 435 to 470 feet bgs consist of a series of interbedded layers of sand and sandy clay (HydroSystems, Inc. 2000). From 435 to 470 feet to approximately 760 to 775 feet bgs, the sediments in the three well boreholes become coarser and are described as sand and gravel, gravel, and sandy clay and gravel. A 20-foot-thick layer of "red clay" is present at 690 feet bgs in both wells 6 and 8. There is no clear contact between Unit 1 and Unit 2 in these well logs. Beneath 760 to 775 feet bgs, a 15-foot layer of "rock" and conglomerate is encountered. More gravel, sand and gravel, and sandy clay are described as present beneath the conglomerate. The driller's log from well 5 describes drilling into "granite" at 830 feet bgs. The three boreholes were drilled to a total depth of between 835 to 845 feet bgs. The base of Unit 2, and the top of Unit 3, could be interpreted to be the top of the "rock" and conglomerate encountered at 760 feet bgs.

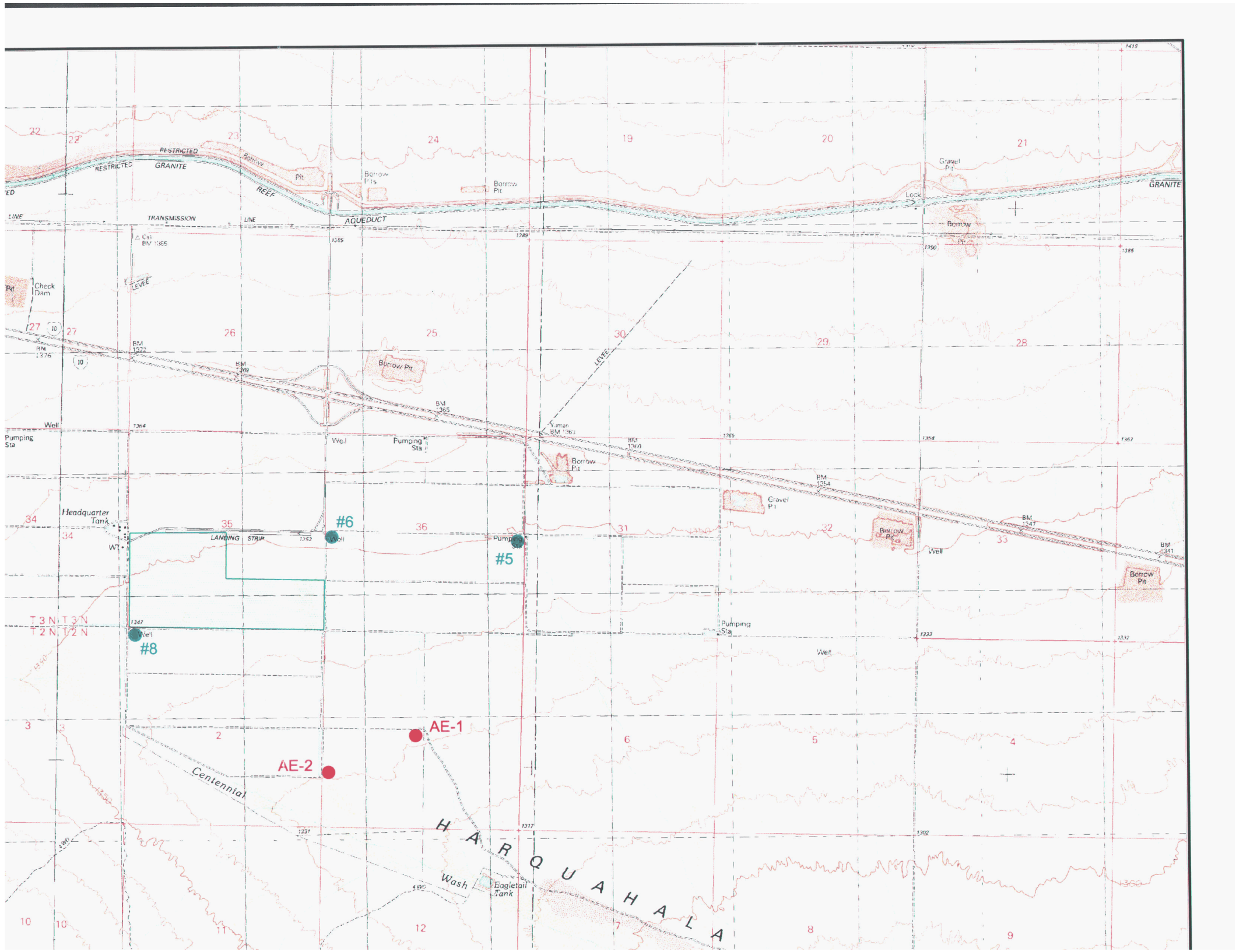
The two Allegheny monitor wells are located in the southwest corner of Section 1, T2N, R11W. One of these two monitor wells, AE-2, lies within the present 100-year floodplain of Centennial Wash. Descriptions of the sediments encountered in the boreholes from both of these wells indicate that this area, the southwest corner of Section 1, has been in the floodplain, if not the wash itself, for the entire Quaternary period and part of the Tertiary. Both well logs describe a continuum of interbedded layers of gravel, sand, and sand and gravel. These sediments probably resulted from the lateral migration of the current and ancestral stream channel.

Sources of groundwater recharge to the Harquahala basin include agricultural irrigation recharge, mountain front recharge, infiltration from surface flows in Centennial Wash and other small epheremal washes, and seepage from the CAP water canals and laterals. Direct seepage from precipitation is negligible. The Vidler Recharge Facility has been permitted to recharge up to 100,000 af/yr of CAP water to the aquifer; however, the facility has not begun operation at this time.

Groundwater Flow Direction

Prior to 1950 and groundwater development, groundwater entered the Harquahala basin at the northwestern corner, between the Eagletail and Little Harquahala Mountains, then flowed southeast and out of the basin at a low gap in the southeastern corner, between Saddle Mountain and the Gila Mountains (Technical Consultants, Inc. 1990). Presently, however, there is minimal, if any, groundwater underflow out of the Harquahala basin, based on November 1998 to November 2000 ADWR groundwater measurements. Long-term agricultural pumping, beginning in the early 1950s, has changed the regional direction of groundwater flow.

Figure B-3.3 presents the groundwater levels measured in the Harquahala basin by ADWR between November 1998 and November 2000. In general, groundwater flows from the mountain fronts toward the western edge of the basin, mimicking the surface water flow paths. Toward the southeastern end of the basin, groundwater flows toward cones of depression caused by historical agricultural irrigation pumping. A 1989 ADWR water level map of the Harquahala basin shows a large cone of depression in the southeast portion of the basin (Hedley 1990). More recent groundwater level measurements indicate that groundwater levels are continuing to increase and that the single large cone of depression has now evolved into two or three smaller, shallower cones of depression.



RESTRICTED
GRANITE
REEF
AQUEDUCT
TRANSMISSION
LINE
LEVEE
Borrow Pits
Borrow Pit
Gravel Pit
Lock
Check Dam
Pumping Sta
Well
Headquarter Tank
LANDING STRIP
#6
#5
#8
AE-1
AE-2
Centennial
Wash
Eagletail Tank
H A R Q U A H A L A
T 3 N T 3 N
T 2 N T 2 N

OVERSIZED MAP

-Depth to Groundwater and Groundwater Elevations November 1998- November 2000 Figure B-3.3

TO REVIEW SEE DOCKET SUPERVISOR

DOCKET L-00000AA-01-0116-0000

Depth to Groundwater

Based on 1999 to 2000 groundwater level measurements collected by ADWR, depth to groundwater in the Harquahala basin regional aquifer generally ranges between 300 and 500 feet bgs. Water levels in perched water zones are commonly 100 to 300 feet above the regional aquifer.

Depth to groundwater in the vicinity of the La Paz Generating Facility is approximately 400 feet bgs. Water levels were collected in April 2000 from the two monitor wells installed in the southwestern quarter of Section 1, T2N, R11W (HydroSystems, Inc. 2000). Monitor well AE-1, located in the northwestern corner of the southwest quarter of Section 1, had a static water level of 403 feet bgs (HydroSystems, Inc. 2000). The corresponding water level elevation is 928 feet above mean sea level (amsl). Monitor well AE-2, located approximately 2,800 feet southwest of monitor well AE-1, had a static water level of 404 feet amsl and a water level elevation of 926 feet amsl (HydroSystems, Inc. 2000). These water levels agree with water levels in nearby wells measured by ADWR from November 1998 through November 2000. Groundwater levels measured by ADWR (November 1998 through November 2000) ranged from 424 feet bgs (water level elevation of 928 feet amsl) in a well located one mile north of monitor well AE-1 to 373 feet bgs (water level elevation of 923 feet amsl) in a well located three miles southeast of monitor well AE-1. Figure B-3.3 shows the groundwater levels and water level elevations for monitor wells AE-1 and AE-2 and all wells measured by ADWR from November 1998 through November 2000.

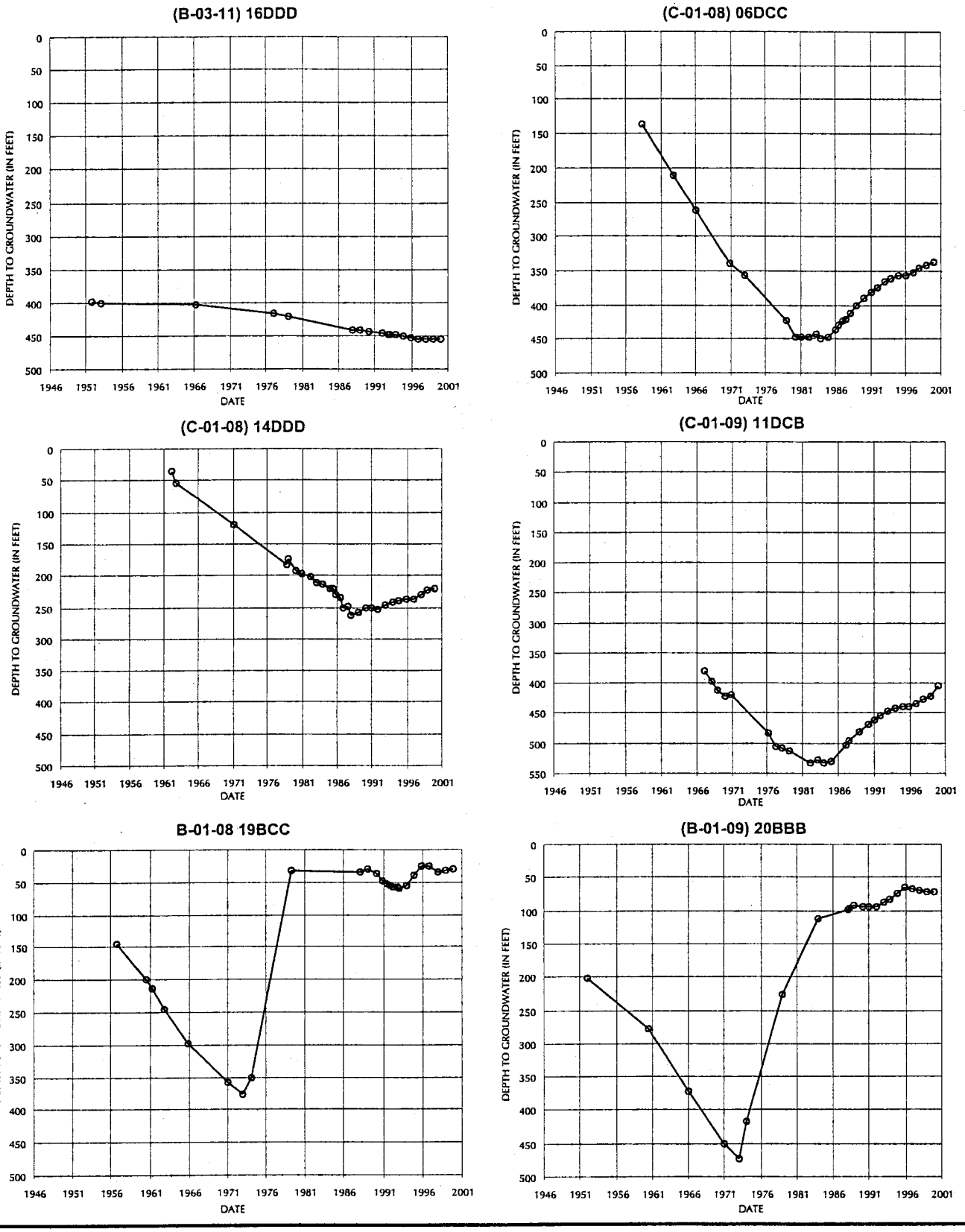
Water Level Trends

Figure B-3.4 shows six hydrographs constructed from water level data on six existing wells in the Harquahala basin. The hydrograph from well (B-03-11) 16DDD, located approximately three miles northwest of the La Paz Generating Facility, indicates that water levels in this area have been slowly declining since approximately 1966 due to agricultural irrigation pumping. In well (B-03-11) 16DDD, the groundwater level has dropped 58 feet over 48 years.

Historical agricultural irrigation pumping in the southeastern portion of the Harquahala basin has had a major effect on groundwater level trends. Figure B-3.4 includes three hydrographs from wells ([C-01-08] 06DCC and 14DDD, and [C-01-09] 11DCB) located at the very southeastern end of the basin. As the three hydrographs show, water levels decreased steadily and dramatically from the late 1950s to the mid-1980s. Some wells in this end of the basin experienced water level declines of over 300 feet prior to the mid-1980s. All three wells show a gradual increase in water levels since the mid-1980s, from 100 to 127 feet.

In August 1985, the Harquahala Valley Irrigation District (HVID) began delivering CAP water to the farmlands via canals and laterals. Due to the importing of CAP water for irrigation purposes and the subsequent reduction in groundwater pumping, the groundwater declines in the southeastern portion of the basin reversed and began to increase.

In T1N, R8 and 9W, water levels also declined from the 1950s to the mid-1980s, up to 275 feet. The land in T1North and T1S, R8W and R9W lies in the center of the Harquahala Valley agricultural area. Hydrographs were constructed from water level data from two wells in this area, (B-01-08) 19BCC and (B-01-09) 20BBB and are included on Figure B-3.4. Both hydrographs show the creation of perched zones in Hydrostratigraphic Unit 1 in the mid to late 1970s. Localized perched zones, resulting from agricultural irrigation recharge, are scattered throughout T1N and T2N and R8W and R9W (refer to Figure B-3.2).



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WATER LEVEL HYDROGRAPHS OF SIX EXISTING WELLS

Allegheny Energy Supply Company, LCC

URS

Figure B-3.4

E1-00001722.03

Water levels in the central Harquahala basin show little, if any, response to the large scale pumping that was occurring in the southeastern end of the basin. Water levels recorded from well (B-02-09) 07ABB from 1963 to 2000 show a decrease of only 7 feet over the 37-year period.

Pumpage History

Agricultural pumping in the Harquahala Valley, particularly the southeastern end of the basin, began in the early 1940s, but increased significantly beginning about 1950 (Technical Consultants, Inc. 1990). During the 1950s, groundwater pumpage increased from an estimated 5,000 to 95,000 af/yr in 1959 (Technical Consultants, Inc. 1990). Maximum pumpage occurred during the years from 1962 to 1965 when the amount of irrigated acres reached approximately 39,500 and groundwater usage was estimated to be 200,000 af/yr (HydroSystems, Inc. 1999). From 1965 through 1981, the groundwater pumping decreased and stabilized at about 100,000 af/yr (Technical Consultants, Inc. 1990). Since 1985 and the introduction of CAP water, groundwater demand has declined. Total reported groundwater pumpage for the Harquahala basin in 1999 was 16,894 ac/ft (ADWR).

Land Subsidence

Groundwater pumping in the Harquahala Valley has resulted in land subsidence and the development of three earth fissures in the southeastern portion of the valley. Graf (1980) describes two earth fissures in T2N, R9W: one in Section 9 and one in Section 36. A third earth fissure was identified in 1997 by ADWR in Sections 20 and 21 of T2N, R10W (HydroSystems, Inc. 1999b). It is not known whether the basin is continuing to subside or if it has stabilized.

WELL INVENTORY AND IRRIGATION RIGHTS

Well Inventory

Data for wells located in the Harquahala basin were obtained from the ADWR Groundwater Site Inventory (GWSI) and Well Registry databases. Table B-3.1 lists the location, ADWR registration number, use, depth, and owner information for all wells reportedly located within 1 mile of the La Paz Generating Facility. These wells have not been field-verified.

According to the ADWR databases, there are 19 wells registered within one mile of the La Paz Generating Facility site. Seven of the 19 wells are reportedly used for agricultural irrigation, three are used for domestic purposes, two are monitor wells, five are exploration wells, and one is a recovery well for the recharge facility. One well is unused.

Allegheny is in the process of a land exchange with BLM for the remaining 480 acres of Section 1 in T2N, R11W. When the land purchase is final, Allegheny will legally abandon one of the two domestic wells (B-02-11 01CBA).

Irrigation Grandfathered Rights

Under the Arizona Groundwater Management Act of 1980 (Arizona Revised Statute (A.R.S.) §45-431), groundwater basins within Arizona known to have insufficient groundwater for agricultural irrigation were designated as Irrigation Non-Expansion Areas (INAs). According to A.R.S §45-437, only land which had been irrigated at any time in the five years preceding the date of establishment of an INA may be irrigated with groundwater. In 1982, ADWR established the Harquahala groundwater basin as an INA. Because the Harquahala groundwater basin was designated as an INA subsequent to the 1980 law, the Harquahala Valley is considered to be a "subsequent INA."

In January 2000, legislation was passed that limited the amount of groundwater withdrawal in a subsequent INA. According to A.R.S. §45-440, groundwater in an amount greater than 100 af/yr can only be withdrawn from a subsequent INA if: (1) the land from which the groundwater is withdrawn has grandfathered rights, (2) the groundwater withdrawals do not cause the water table to drop below 1,000 feet bgs at the site of withdrawal, and (3) the withdrawals do not cause a decline in water levels of more than 10 feet per year. In addition, A.R.S. §45-440 states that the amount of groundwater that can be withdrawn per acre of land cannot exceed 6 af/yr, or an average of 3 af/yr for any 10-year period.

Allegheny has acquired approximately 2,325 acres of farmland in the Harquahala Basin, shown on Figure B-3.5, that are eligible for irrigation under the requirements of the INA (A.R.S. §45-437[B]). Allegheny intends to manage these lands so that they are not irrigated with groundwater during the period of the project. The land also may be irrigated with CAP water to maintain its existing agricultural use. Allegheny's use of groundwater for the project would be in compliance with A.R.S §45-440 (A), which provides for withdrawals of groundwater for commercial or industrial uses in an amount of 6 acre-feet in any year or a maximum of 30 acre-feet for any period of 10 consecutive years.

ON-SITE MONITOR WELLS

In April 1999, HydroSystems, Inc. installed two monitor wells in the southwestern quarter of Section 1, T2N, R11W for Allegheny (HydroSystems, Inc. 2000). Monitor well AE-1 is located in the northeastern corner of the southwestern quarter of Section 1; monitor well AE-2 is located approximately 2,800 feet southwest of monitor well AE-2. The borehole for monitor well AE-1 was drilled to a depth of 860 feet then backfilled to 560 feet bgs. Monitor well AE-2 was drilled to a depth of 800 feet then backfilled to 500 feet bgs (HydroSystems, Inc. 2000). Geophysical logging (caliper, spontaneous potential, resistivity, neutron, and gamma ray) was conducted on both wells (HydroSystems, Inc. 2000).

Both wells are cased with 5-inch-diameter Schedule 80 polyvinyl chloride (PVC) and screened with 80 feet of 0.30 inch slotted well screen. Monitor well AE-1 is screened from 480 to 560 feet bgs and monitor well AE-2 is screened from 470 to 550 feet bgs.

Short-term (three-hour) aquifer pumping tests were conducted on both wells upon completion of development (HydroSystems, Inc. 2000). Due to immediate drawdown in both wells during the tests, the standard Theis-Jacob recovery calculations were not used to estimate transmissivity values. The transmissivity values from these two three-hour pumping tests were calculated from specific capacity (flow rate /total water level drawdown). Estimated transmissivity values were 22,500 gpd/ft for monitor well AE-1 and 34,000 gpd/ft for monitor well AE-2 (HydroSystems, Inc. 2000).

One groundwater sample was collected from each monitor well. The analytical results are discussed in the following section. The well completion report detailing the construction, development, testing, and sampling of the two monitor wells is included in Attachment B-3.1 (HydroSystems, Inc. 2000).

GROUNDWATER QUALITY

Groundwater samples from wells in the Harquahala basin were collected by ADWR from 1984 through 1989. The results of those analyses are presented in the 1990 ADWR report (Hedley 1990). In general, specific conductance values in the northwestern portion of the Harquahala basin ranged from 495 microsiemens per centimeter (μS/cm) to 1,750 μS/cm. Concentrations of dissolved solids may be

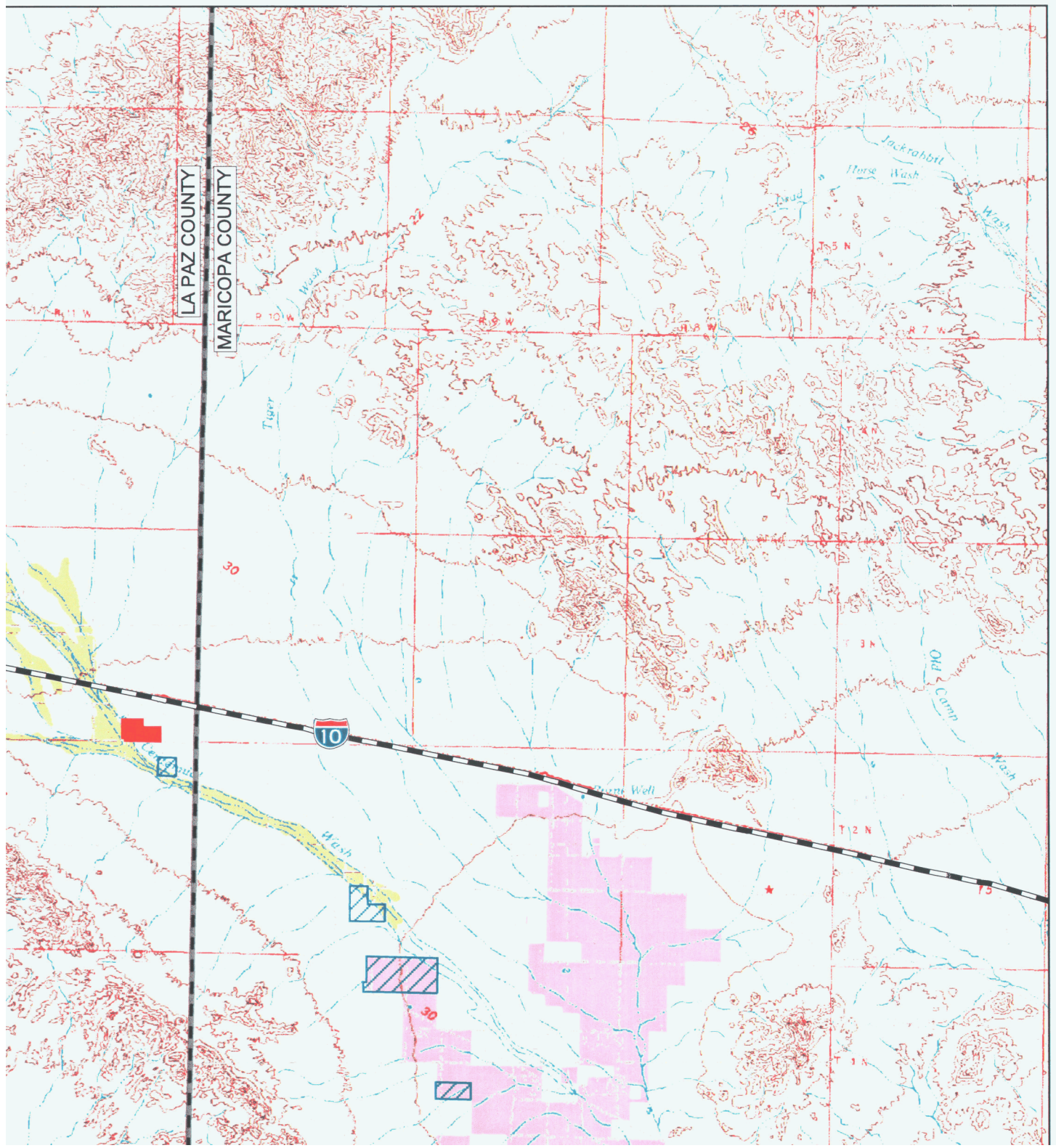

Figure B-3.5
Allegheny Properties and Irrigation Districts

La Paz Generating Facility

Allegheny Energy Supply
an Allegheny Energy company

Legend

- Allegheny Properties
- McMullen Irrigation District
- Harquahala Irrigation District
- Generating Facility Site

General Project Location In Arizona

Sources:
USGS, Phoenix 1x2 Degree Quadrangle, Revised 1969.

Working Draft 06/25/01

approximated by multiplying specific conductance values by 0.6, which is the approximate ratio of the total dissolved solids (TDS), in milligrams per liter (mg/L), to specific conductance in µS/cm. Groundwater samples collected from wells located in the southeastern end of the basin indicate that water quality declines towards the center of the agricultural area. Specific conductance values in the southeastern portion of the basin ranged from 715 to 2,150 µS/cm (approximately 429 to 1,290 mg/L TDS) in the regional aquifer and 440 to 6,990 µS/cm (approximately 264 to 4,194 mg/L of TDS) in the perched zones. The average specific conductance value in the perched zone was 3,565 µS/cm (approximately 2,139 mg/L TDS). The federal secondary maximum contaminant level (SMCL) for TDS is 500 mg/L. However, SMCLs are based on aesthetic qualities of the water (taste, odor, color) and are not enforceable.

Fluoride concentrations across the basin range from 0.3 to 20.0 mg/L, with the perched zones containing the highest concentrations. Several of the wells screened in the regional aquifer contain fluoride concentrations above the Aquifer Water Quality Standard (AWQS) of 4.0 mg/L. According to Technical Consultants, Inc., the elevated fluoride levels in the regional aquifer are from a natural source and were evident in groundwater quality samples collected prior to agricultural development of the basin (Technical Consultants, Inc. 1990).

Groundwater quality samples collected by ADWR in January 1989 indicate a number of wells screened in the perched zones contained concentrations of nitrate above the AWQS of 10.0 mg/L (Technical Consultants, Inc. 1990). One well, (C-01-08) 08BBB, contained a chromium concentration of 1.1 mg/L (sample collected by ADWR in August 1984). The AWQS for chromium is 1.0 mg/L (Technical Consultants, Inc. 1990).

A request was made to the Arizona Department of Environmental Quality (ADEQ) for a search of its water quality database for all groundwater quality analyses collected in the Harquahala basin. This request resulted in analyses for one groundwater sample. The sample was collected from a well in Section 11, T2N, R9W in January 1990 and analyzed only for volatile organic compounds (VOCs). No VOCs were detected in the sample above laboratory detection limits.

In April 2000, one groundwater sample was collected from each of the two Allegheny monitor wells, AE-1 and AE-2 (HydroSystems, Inc. 2000). The analytical results from the two samples are presented in Table B-3.2. Total dissolved solids concentrations were 650 mg/L in monitor well AE-1 and 790 mg/L in monitor well AE-2. Monitor well AE-1 contained fluoride concentrations above the AWQS of 4.0 mg/L and monitor well AE-2 contained nitrate concentrations above the AWQS of 10 mg/L. All metals concentrations were below AWQS. As discussed above, fluoride concentrations are elevated throughout the basin and are probably from a natural source. The source of the nitrate in monitor well AE-2 is unknown but may be due to upgradient agricultural practices.

PROPOSED PRODUCTION WELL FIELD

The La Paz Generating Facility will require 6,500 af/yr or less of groundwater to operate the 1,080 MW facility. Allegheny has acquired approximately 6,975 af/yr of irrigation grandfathered rights from the purchase of 2,325 acres of land in the Harquahala Valley. A proposed production well field was designed for the La Paz Generating Facility using five wells, all of which are located in the northern half of Section 1, T2N, R11W.

In 1999, HydroSystems, Inc., at the request of Vidler Water Company, developed a groundwater flow model of the Harquahala basin. The model was used to predict the effects to the aquifer from the recharge facility and to obtain an underground storage facility (USF) permit from ADWR. At the request of Allegheny, HydroSystems, Inc. used the model to estimate water level drawdowns produced by the five

TABLE B-3.2 GROUNDWATER QUALITY DATA			
Chemical	**Units**	**Monitor Well AE-1**	**Monitor Well AE-2**
Sample Collection Date		**04/20/00**	**04/28/00**
pH – laboratory	Standard unitts	7.62	7.78
Specific conductance – lab	umhos/cm	1100	1500
Total dissolved solids	mg/L	650	790
Total alkalinity	mg/L	260	210
Hardness	mg/L	96	160
Chloride	mg/L	98	170
Fluoride	mg/L	5.1	3.1
Nitrate as N	mg/L	2.0	33.0
Nitrite as N	mg/L	< 1.0	< 1.0
Sulfate	mg/L	130	160
Calcium	mg/L	18	30
Magnesium	mg/L	12	20
Potassium	mg/L	4.4	5.7
Sodium	mg/L	210	250
Antimony	mg/L	< 0.004	< 0.004
Arsenic	mg/L	0.012	0.007
Barium	mg/L	0.039	0.025
Beryllium	mg/L	< 0.004	< 0.004
Cadmium	mg/L	< 0.005	< 0.005
Chromium	mg/L	0.019	0.011
Copper	mg/L	< 0.020	< 0.020
Iron	mg/L	0.42	0.17
Lead	mg/L	0.0087	< 0.002
Manganese	mg/L	< 0.020	< 0.020
Mercury	mg/L	< 0.0002	< 0.0002
Nickel	mg/L	< 0.050	< 0.050
Selenium	mg/L	< 0.004	0.0045
Silver	mg/L	< 0.005	< 0.005
Zinc	mg/L	0.12	0.100
Total cyanide	mg/L	< 0.020	< 0.020

production wells for the projected 30-year life of the facility. Three scenarios were developed: (1) a base case of groundwater conditions in the basin which was used to compare with the other two scenarios, (2) a case of the pumping effects only from the five Allegheny production wells, and (3) a case simulating the combined effects of the pumping from the production wells and the recharge from the Vidler Recharge Facility. A copy of the modeling report, which details the assumptions, input parameters, and conditions, is included in Attachment B-3.2.

Modeling Method

Groundwater flow in the Harquahala basin was simulated using MODFLOW, a modular three-dimensional finite difference groundwater flow model developed by the United States Geological Survey (USGS) (McDonald and Harbaugh 1988). The modeling was conducted under the pre- and post-processor Visual MODFLOW, a graphical interface that allows for viewing model output (Guiguer and Franz

1998). MODFLOW and Visual MODFLOW are both well-documented, widely used, and well-verified software packages.

Model Layers

Two model layers were used to represent the hydrogeologic system in the Harquahala basin. Model layer 1 includes the sediments from the land surface to the base of the MAU. The UAU was not simulated separately because, except where perched zones exist from excess irrigation water, it is unsaturated. The MAU was modeled as an unconfined aquifer. Model layer 2 represents the LAU. The LAU was modeled as a fully convertible, confined/unconfined aquifer. The bottom of model layer 2 corresponds to the depth to bedrock at the basin margins. The center of the basin was simulated with a maximum depth of 1,500 feet.

Simulation Periods

The model was used to simulate pre-development and post-development hydrologic conditions in the Harquahala Valley. The pre-development period was defined as the time period before 1949. Although groundwater pumping began in the valley in 1940, there were not sufficient data available to model and calibrate to the pre-1940 time period. The earliest year that contained several groundwater level data points for calibration was 1949. It was assumed in this model that the effects of pumping less than 1,000 af/yr were minimal, and hence, groundwater level data from 1949 reasonably could be used to represent pre-development conditions. A transient model was constructed to represent the post-development period from 1950 to 1997.

Three different scenarios were run in order to determine the impact of the pumping by the La Paz Generating Facility. Scenario 1 simulated 1997 groundwater conditions for 34 years into the future, until 2032. Scenario 1 was used as a "base case" to which the other two scenarios were compared in order to determine impacts on groundwater. Scenario 2 was a continuation of Scenario 1 with the addition of pumping from the Allegheny production wells from 2002 to 2031, a 30-year time period of operation. The five Allegheny production wells were simulated to be pumping at a rate of 868 gallons per minute each, a total of 7,000 af/yr. Scenario 2 acted as a "worst case," where the pumping rate was at a maximum with no attempt to mitigate the effects of the pumping.

The final scenario, Scenario 3, simulated the same conditions from Scenario 1 plus the pumping from the Allegheny production wells (Scenario 2), but had the addition of recharge from the nearby Vidler Recharge Facility. Scenario 3 acted as a "best case" where the impacts of pumping were minimized due to the significant recharge volumes at the nearby Vidler Recharge Facility. The recharge rate from the Vidler Recharge Facility was modeled in increasing increments, beginning at 5,000 af/yr in 2002 to 70,000 af/yr in 2006 through 2031. Although the recharge facility is permitted for 100,000 af/yr, it is unlikely that the maximum volume will be recharged in the first few years of operation.

The ending water levels from Scenarios 2 and 3 were compared to Scenario 1 in order to determine the likely impacts of the Allegheny production wells. Water level maps illustrating the results of the three scenarios are shown on Figures 2 through 6 in Attachment B-3.2.

Results

The results of Scenario 1 indicate that if groundwater pumping and recharge in the Harquahala basin were to continue at the current rate for the next 30 years, groundwater levels would decline between 20 to 40 feet in the vicinity of the La Paz Generating Facility and increase 50 to 70 feet in the southeastern portion of the basin. Figure 2 in Attachment B-3.2 presents the simulated groundwater conditions of Scenario 1.

Scenario 2 simulated groundwater conditions after 30 years of groundwater pumping and recharge at the current rate (Scenario 1) plus 7,000 af/yr of pumping from the five Allegheny production wells. The resulting water levels in Scenario 2 indicate that the pumping from the production wells will create an additional 30 feet of drawdown in the immediate vicinity of the well field after 30 years. Wells located 3 to 5 miles from the production well field will experience water level declines of 20 feet in addition to the drawdown predicted in Scenario 1. Figures 3 and 4 in Attachment B-3.2 show the results of Scenario 2.

For Scenario 3, recharge from the Vidler Recharge Facility was added to the conditions simulated in Scenario 2. The recharge rate was assumed to begin in 2002 at 5,000 af/yr and increase incrementally to a maximum of 70,000 af/yr for 2006 through 2031. The model predicts a net water level increase of 300 feet in the immediate vicinity of the Vidler Recharge Facility and a net increase of 150 to 175 feet in the area of the Allegheny production well field. The recharge mound is projected to extend across the entire Harquahala basin, with a minimum increase of less than 25 feet in the southeastern portion of the basin. The results from Scenario 3 indicate that the effects of pumping by the five Allegheny production wells will not be apparent when considered with the water recharged by the Vidler Recharge Facility. The results of Scenario 3 are shown on Figures 5 and 6 in Attachment B-3.2.

Scenario 2, simulating drawdown effects from currently active wells and Allegheny's proposed production wells, presents a "worst-case" scenario. Scenario 3 adds the effects of the recharge water from the Vidler Recharge Facility to Scenario 2 and simulaties a "best-case" scenario. Any recovery or pumpage of the water in the Vidler Recharge Facility would result in groundwater level conditions somewhere between Scenario 2 and Scenario 3.

CONCLUSIONS

The results of this water supply study indicate that there is a sufficient supply of groundwater of suitable quality to meet the demands of the La Paz Generating Facility for the projected 30-year life of the facility. The conclusions of the study are summarized as follows:

- The net effect of pumping from the five Allegheny production wells combined with recharge from the Vidler Recharge Facility is an overall increase in water levels throughout the basin.

- Based on the analysis of groundwater samples collected from on-site monitor wells and available published data, the groundwater is of sufficient quality to be used in the operation of the facility. TDS concentrations in the two on-site monitor wells were 650 and 790 mg/L. Fluoride concentrations exceeded AWQS in one well and nitrate concentrations exceeded AWQS in the other well. There were no metal concentrations exceeding the numeric AWQS.

- The modeling results simulating the effects of pumping from the five Allegheny production wells for 30 years predict a total drawdown of 30 feet in the immediate vicinity of the well field. The calculated impact on wells located 3 to 5 miles away from the well field is a decrease of 20 feet in the groundwater level over the 30-year period.

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ATTACHMENT B-3.1—ALLEGHENY ENERGY SUPPLY COMPANY, LLC MONITOR WELL COMPLETION REPORT

(This report is not included but may be obtained by request.)

ATTACHMENT B-3.2—HARQUAHALA VALLEY MODELING REPORT

Harquahala Valley

Modeling Report

Prepared for:

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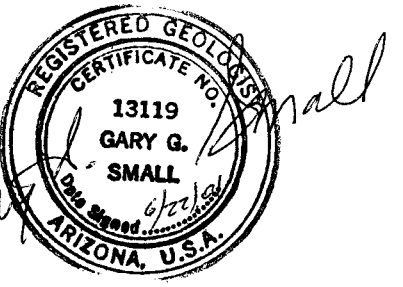

June 19, 2001

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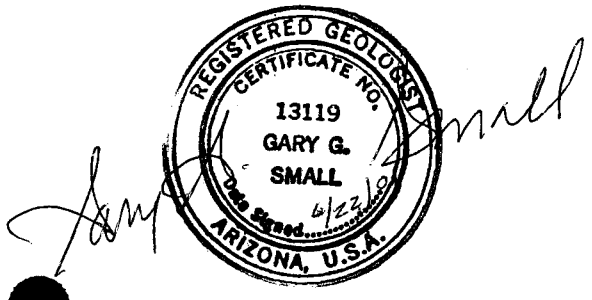


1.1 PURPOSE

The purpose of this model was to determine the impact to groundwater conditions due to pumping from wells operated by the proposed Allegheny Energy Supply Company (Allegheny) plant in Harquahala Valley. In order to determine this groundwater impact, the Harquahala Valley, Maricopa and La Paz Counties, Arizona Numerical Ground-water Flow Model was utilized to simulate current and future groundwater flow conditions under a set of differing scenarios (HydroSystems, Inc., 1999b). This numerical groundwater model of the Harquahala Valley had been previously submitted and approved by the Arizona Department of Water Resources (ADWR) as part of Vidler Water Company's Full Scale Underground Storage Facility (USF) Permit Application, to determine the impacts of their recharge project at MBT Ranch (HydroSystems, Inc., 1999a). The numerical groundwater flow model allows the simulation of differing stresses (i.e. groundwater pumping, artificial recharge, etc.) to the natural groundwater flow regime. The impacts of these stresses are evaluated by calculating the change in water levels.

It is not the intent of this document to describe in detail the creation of the groundwater flow model. For more information concerning the creation of the Harquahala Valley, Maricopa and La Paz Counties, Arizona Numerical Ground-water Flow Model, the reader is referred to its documentation (HydroSystems, Inc., 1999b). However, as part of this modeling report, it is important to reiterate some of the components of the model in order to discuss the impacts of individual scenarios as simulated by the model. The following sections briefly describe the model code, characteristics, and construction for the steady-state model, the transient-state model, and three different future scenarios.

1.2 MODEL CODE

Ground-water flow in the Harquahala Valley Basin was simulated with MODFLOW, a modular three-dimensional finite difference ground-water flow model developed by the United States Geological Survey (USGS) (McDonald and Harbaugh, 1988). The modeling was conducted under the pre- and post-processor Visual MODFLOW, a powerful, graphical interface

that allows for ease in model input and for viewing model output (Guiguer and Franz, 1998). MODFLOW and Visual MODFLOW are both well documented, widely-used, and well-verified software packages. Using a numerical code such as MODFLOW enables the simulation of three-dimensions, aquifer heterogeneity, boundary conditions, and transient stresses to the aquifer.

1.3 SIMULATION PERIODS

The model was used to simulate pre-development hydrologic conditions in the Harquahala Valley. This would represent the time period before 1940. However, there were not sufficient data available to model and calibrate to the pre-1940 time period. The earliest year that contained several ground-water level data points for calibration was 1949. Groundwater pumping began in the valley in 1940, but was minimal (less than 1,000 af/yr) until 1950. It was assumed in this model that the effects of pumping less than 1,000 af/yr were minimal, and that ground-water level data from 1949 could reasonably be used to represent pre-development conditions. Pre-development conditions were assumed to represent a steady-state hydrologic system and were modeled as such. Pumping from 1940-1949 was not simulated in the steady-state model.

A transient model was constructed to represent the post-development time period from 1950 to 1997. In a transient model the simulation period is descretized into stress periods. A stress period represents a period of time during which stresses on the aquifer are constant. Stresses such as pumping, recharge, or boundary conditions can change from one stress period to the next.

Subsequent to the transient analysis, three different scenarios were run in order to determine the impact of the pumping by the proposed Allegheny Plant. Scenario 1 simulated 1997 (the end of the transient model) stresses for 34 years into the future, until 2032. Scenario 1 was used as a "base case" to which all other scenarios are compared in order to determine impacts to groundwater conditions. Scenario 2 simulated 7,000 acre feet per year (ac-ft/yr) of pumping from Allegheny wells from 2002 through 2031, a 30 year time period of operation. Scenario 2

acts as a "worst case," where the pumping rate is at a maximum with no attempt to mitigate the effects of the pumping. The final scenario, Scenario 3 simulated the same pumping from Allegheny wells as had been simulated in Scenario 2, but has the addition of recharge from the nearby Vidler Recharge facility. Scenario 3 acts as a "best case" where the impacts of pumping are minimized due to the significant recharge volumes at the nearby Vidler Recharge Facility. The ending water levels from Scenarios 2 and 3 were compared to Scenario 1 in order to determine the likely impacts of the Allegheny wells

1.4 MODFLOW PACKAGES

The model was constructed using six MODFLOW packages: (1) the BASIC package, (2) the Block Centered Flow package (BCF), (3) the WELL package, (4) the RECHARGE package, (5) the EVAPOTRANSPIRATION package, and (6) the WHS solver package (a bi-conjugate gradient stabilized acceleration routine).

The BASIC package handles the administrative tasks of computer modeling. It reads the model grid, layers, and stress periods. It allocates computer memory, reads the location of input files, and identifies boundary conditions. The BASIC package also allocates time descretization, reads initial heads, and calculates the overall water budget information.

The BCF package computes the terms to calculate the rate of flow into and out of storage, and the conductance components to determine flow between cells.

The WELL package simulates withdrawals from or additions to the groundwater system at a user specified rate during a specified stress period from features such as pumping wells or injection wells. The WELL package was used to simulate pumping wells in the basin, and to simulate underflow from Tiger Wash Basin, Palomas Basin, and Hassayampa Plains.

The RECHARGE package simulates the aerial distribution of recharge to the aquifer. Because MODFLOW is a fully saturated model, use of the RECHARGE package assumes that the recharged water instantaneously reaches the water table. It does not allow for the travel time

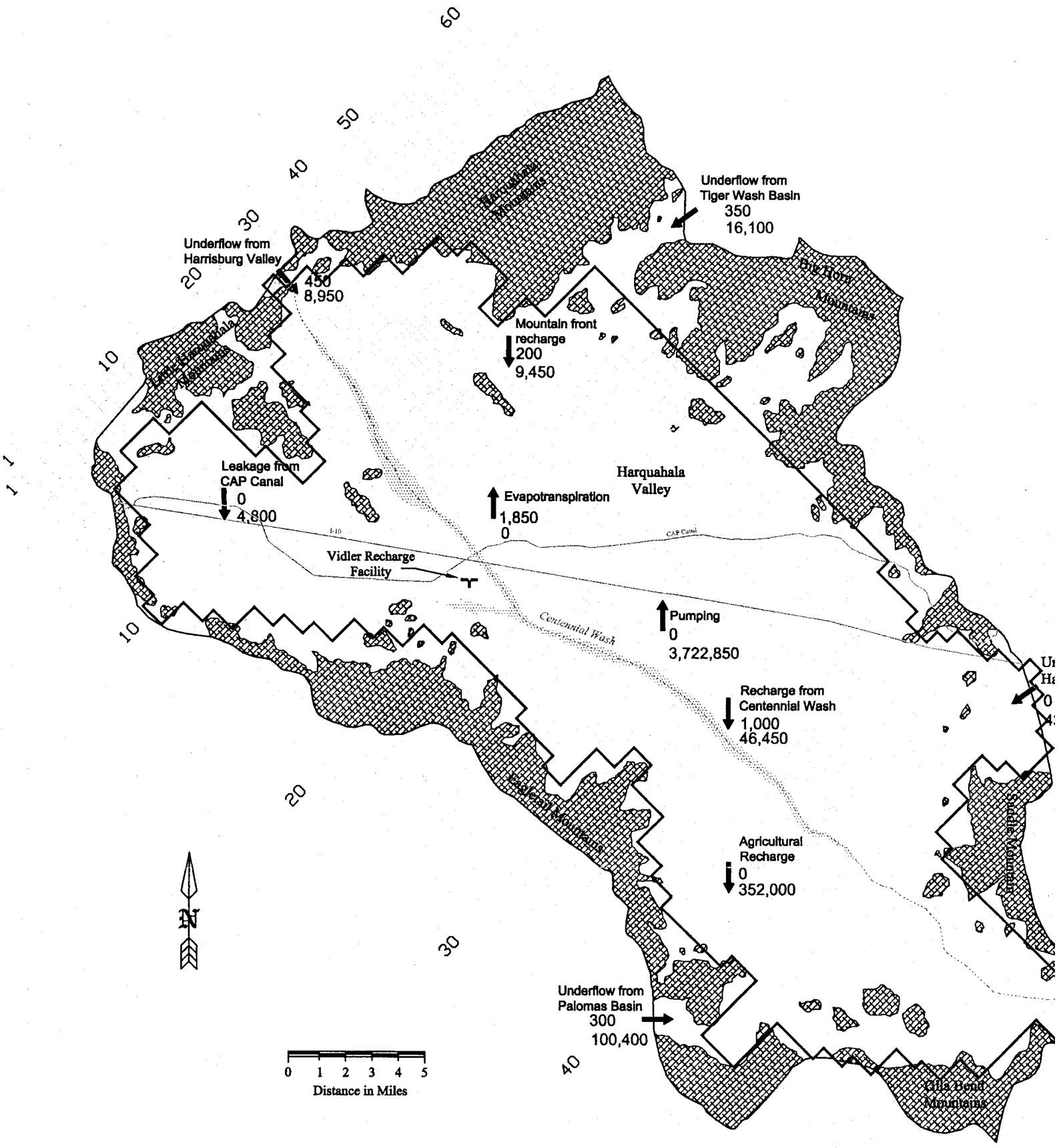
needed for the water to travel through the vadose zone. In this model, the RECHARGE package was used to simulate recharge from ephemeral streams, mountain-front recharge, deep percolation from excess applied irrigation water, and recharge from CAP canal leakage and other canals within the Harquahala Valley Irrigation District (HVID). The RECHARGE package was also used in predictive model simulations to simulate artificial recharge at the Vidler Recharge Facility

The EVAPOTRANSPIRATION package simulates the effects of plant transpiration and evaporation from the water table. The user specifies a maximum evapotranspiration (ET) rate and a maximum depth (extinction depth) to which ET can occur. The EVAPOTRANSPIRATION package was used to simulate ET during the pre-development period when depth to groundwater was less than 30 feet in the southeastern portion of the basin.

The WHS solver for Visual MODFLOW was used to solve the system of simultaneous equations produced by the model. The WHS solver approaches the solution iteratively through an approximation scheme. The WHS solver provided a stable solution for this model. A complete and thorough description of the WHS solver can be found in the Visual MODFLOW User's Manual (Guiguer and Franz, 1998).

1.5 MODEL GRID

The modeled area encompasses the entire Harquahala Valley basin and is approximately 870 mi^2. The model grid is oriented NW/SE along the axis of the valley. The grid has a variable cell size and contains 62 columns and 55 rows. The variable grid size allows for finer resolution and precision in areas of steep hydraulic gradients, such as near pumping wells. There are two types of cells used in the model: inactive and active cells. Inactive cells represent areas that do not interact with the groundwater system being modeled, such as a hard rock outcrop, or cells outside of the groundwater basin. Active cells represent the aquifer being modeled. A map of the study area showing the model grid and water budget components is displayed in *Figure 1.*


Underflow from
Tiger Wash Basin
350
16,100
Harquahala
Mountains
Underflow from
Harrisburg Valley
450
8,950
Big Horn
Mountains
Mountain front
recharge
200
9,450
Leakage from
CAP Canal
0
4,800
Harquahala
Valley
Evapotranspiration
1,850
0
I-10
CAP Canal
Vidler Recharge
Facility
Centennial Wash
Pumping
0
3,722,850
Recharge from
Centennial Wash
1,000
46,450
Eagletail Mountains
Agricultural
Recharge
0
352,000
Underflow from
Palomas Basin
300
100,400
Gila Bend
Mountains
N
0 1 2 3 4 5
Distance in Miles

1.6 MODEL LAYERS

The sediments within Harquahala Valley have typically been descretized into three hydrologic units: the Upper Alluvial Unit (UAU), the Middle Alluvial Unit (MAU), and the Lower Alluvial Unit (LAU). Two model layers were used to represent the hydrogeologic system in Harquahala Valley. Model layer 1 represents the sediments between the land surface and the bottom of the MAU. The UAU was not separately simulated because, except where saturated by perched water from excess irrigation water, it is unsaturated within the model area. The perched aquifer system was not simulated in the model. The MAU was modeled as an unconfined aquifer, where the water table is exposed to and fluctuates with changes in atmospheric pressure. Model layer 2 represents the LAU. The LAU was modeled as a fully-convertible, confined/unconfined aquifer. In this situation, the layer is confined unless the water table falls below the top elevation of the LAU. A confined aquifer is one that is at greater than atmospheric pressure, usually caused by an overlying confining layer such as the fine-grained sediments found in the MAU. The bottom of model layer 2 corresponds to the depth to bedrock at the basin margins. The center of the basin was simulated with a maximum depth of 1,500 feet.

1.7 BOUNDARY CONDITIONS

The selection of the conditions that define the model boundaries is one of the most important parameters to ensure an accurate solution. Two boundary types were used in this model: specified head and specified flux. A specified head boundary is one where the head elevation is specified and held constant throughout the model simulation. Hydraulic head is a measure of the total energy of the groundwater system and in an unconfined system like in the Harquahala Valley, head is measured as the elevation of the groundwater table. A specified head boundary can be used along the edges of the model area to represent areas of underflow if the hydraulic head is known, or it could also be used as an internal boundary to represent a river or lake if the stage elevation is known. In the steady-state model, specified head cells were used to represent underflow into the basin from Harrisburg Valley and underflow out of the basin

through Mullen's Cut (*Figure 1*). In the transient model specified head cells were used to represent underflow into the basin from Harrisburg Valley (*Figure 1*).

A specified flux boundary is one where the flow entering or leaving the aquifer system is defined. This type of boundary could be used to define underflow to or from the aquifer, in locations where the flow is known but heads are not well defined. Specified flux boundaries also can specify a flow of zero, or a "no-flow" boundary condition. No-flow boundaries are simulated by defining the cell as inactive, and therefore do not allow groundwater to enter the cell. Inactive cells were used in this model to represent the hard rock boundaries surrounding the basin. Specified flux boundaries were also used to represent underflow from adjacent basins, for which flow had been estimated but heads were not well defined. In the steady state model specified flux boundaries were used to represent underflow from Tiger Wash Basin and Palomas Basin (*Figure 1*). In the transient model specified flux boundaries were used to represent underflow from Tiger Wash Basin, Palomas Basin, and Hassayampa Plain (*Figure 1*). The specified flux boundaries were simulated using pumping wells in the WELL package.

1.8 DATA INPUT REQUIREMENTS

In addition to the model layers, model grid, and boundary conditions, there are several parameters that must be defined for the numerical model. These include aquifer properties such as hydraulic conductivity, and for a transient model, storage terms. Also, any stresses to the system must be defined such as groundwater pumping, evapotranspiration, and recharge. Finally, an initial head array must be specified. These data requirements are discussed below.

1.8.1 Hydraulic Conductivity

Initial estimates of hydraulic conductivity (K) were developed using specific capacity data calculated from data in the Groundwater Site Inventory (GWSI) database (ADWR, 1998a), and published conductivity values for similar materials. Model layer 1 has hydraulic conductivity values that range from 2 to 30 feet/day, the larger values corresponding to areas at the edges of the basin where the sediments grade into coarser-grained sands and gravels. Model

layer 2 has hydraulic conductivity values that range from 1 to 40 feet/day, the lower values corresponding to areas in the center of the basin where finer-grained sediments would be expected or where driller's logs indicate volcanic sediments.

Hydrologic properties of an aquifer, like hydraulic conductivity, usually do not have the same value in all directions. For example, hydraulic conductivity may be larger in the direction of ground-water flow than in the direction perpendicular to ground-water flow if the permeability of the sediments is greater along the direction of flow, representing the mechanism by which the sediments were deposited. This is termed horizontal anisotropy. Likewise, horizontal hydraulic conductivity is usually larger than vertical hydraulic conductivity because compaction of the aquifer sediments over time decreases the vertical permeability. The difference between horizontal and vertical hydrologic properties is termed vertical anisotropy. It is often not practical to measure the vertical hydraulic conductivity or to quantify the horizontal anisotropy of an aquifer. Often, anisotropy is expressed as a ratio between the hydraulic conductivity in two horizontal directions (horizontal anisotropy) or between the horizontal and the vertical hydraulic conductivity (vertical anisotropy).

In a numerical model, vertical anisotropy ratios ranging from 1:1 to 1000:1 are common (Anderson and Woessner, 1992). Horizontal anisotropy ratios are typically much less, or are assumed to be equal to 1:1 for modeling purposes. In the Harquahala Valley model, horizontal anisotropy was assumed to equal 1:1. The calibrated vertical anisotropy ratios were uniform for each model layer and were equal to 100:1 for model layer 1 and 50:1 for model layer 2.

1.8.2 Storage

There are little data available on the storage properties of the sediments in the Harquahala Basin. Cella Bar Associates (1991) performed a long-term pumping test in the northwest portion of Harquahala Valley to estimate storativity. The average value of specific yield from this pump test was 17 percent. Early drawdown data analyzed with the Boulton and Neuman methods gave

specific storage[1] (Ss) estimates of 10^{-4} ft^{-1}. Calibrated storage values from the ADWR's Salt River Valley (SRV) model were used as initial estimates for this model. Model layer 1 was modeled as unconfined and the specific yield values range from 3 to 12 percent. Model layer 2 was modeled as a fully convertible layer that is confined when model layer 1 is saturated and unconfined when the water level elevation falls below the bottom of model layer 1. The specific yield values in model layer 2 range from 3 to 12 percent and the specific storage value was a uniform 10^{-5} ft^{-1}.

1.8.3 Recharge

The recharge package was used to simulate natural recharge to Harquahala Valley. Recharge from Centennial Wash and mountain-front recharge were simulated in the steady state model, and recharge from Centennial Wash, mountain-front recharge, leakage from the CAP canal, and agricultural recharge were simulated in the transient model. For a detailed discussion of the derivation of the estimates for these water budget parameters see the Harquahala Valley, Maricopa and La Paz Counties, Arizona Numerical Ground-water Flow Model (HydroSystems, Inc., 1999b).

1.8.4 Evapotranspiration

The EVAPOTRANSPIRATION package was used to simulate ET in the steady-state model. ET was not simulated in the transient model because during the post-development period, depth to groundwater was much greater than 30 feet and ET was considered negligable. Phreatophyte growth is sustained (and therefore ET is a factor) when depth to groundwater is less than 30 feet (Corell and Corkhill, 1994).

[1] Specific Storage (Ss) is defined by Fetter (1994) as "the amount of water per unit volume of a saturated formation that is stored or expelled from storage owing to compressibility of the mineral skeleton and the pore water per change in head." Ss has units of one over length; in this case ft^{-1}.

1.8.5 Pumping

The WELL package was used to simulate pumping wells in Harquahala Valley in the transient, post-development model and to simulate underflow from adjacent basins in both models. For the years 1985-1997, pumping information was obtained from the Registry of Groundwater Rights (ROGR) database (ADWR, 1998b). This database provided information on which wells were actively pumping each year and the volume pumped. For the years from 1950 to 1984 the only data available were estimates of the total volume pumped from the basin. The distribution of this pumping was unknown and data such as power records or historic cropped areas were unavailable. For a detailed discussion of the distribution of pumping from Harquahala Valley, see the Harquahala Valley, Maricopa and La Paz Counties, Arizona Numerical Ground-water Flow Model (HydroSystems, Inc., 1999b).

1.8.6 Ground-Water levels

Ground-water level data for the pre-development period (pre-1950) was obtained mainly from a map of pre-development ground-water level elevations for Harquahala Basin from Freethey and Anderson (1986). A few additional data points were obtained from the ADWR's GWSI database (ADWR, 1998a). There was not sufficient data to produce observed hydraulic head maps for both the MAU (model layer 1) and the LAU (model layer 2). Just one ground-water level map of all of the available data was constructed and used as the calibration target for the steady state model. Only slight vertical hydraulic gradients exist between the MAU and the LAU during the post-development period and therefore vertical gradients were likely even smaller during the pre-development period. The ground-water levels in layer 1 should therefore be representative of both units for the pre-development hydrologic system.

The observed ground-water level elevations from the pre-development period (as contained in the GWSI) were used as the initial conditions in the steady state model. Ground-water level data for the post-development period (post-1950) were also obtained from the ADWR's GWSI database (ADWR, 1998a) The transient model was calibrated to these data for three time periods: 1963, 1979, and 1997. The model output of hydraulic heads from the steady

state model were used as the initial head conditions for the transient model. Subsequently, the output of hydraulic heads from the end of the transient model (1997) were used as initial head conditions for each of the following scenarios.

1.9 SCENARIO 1

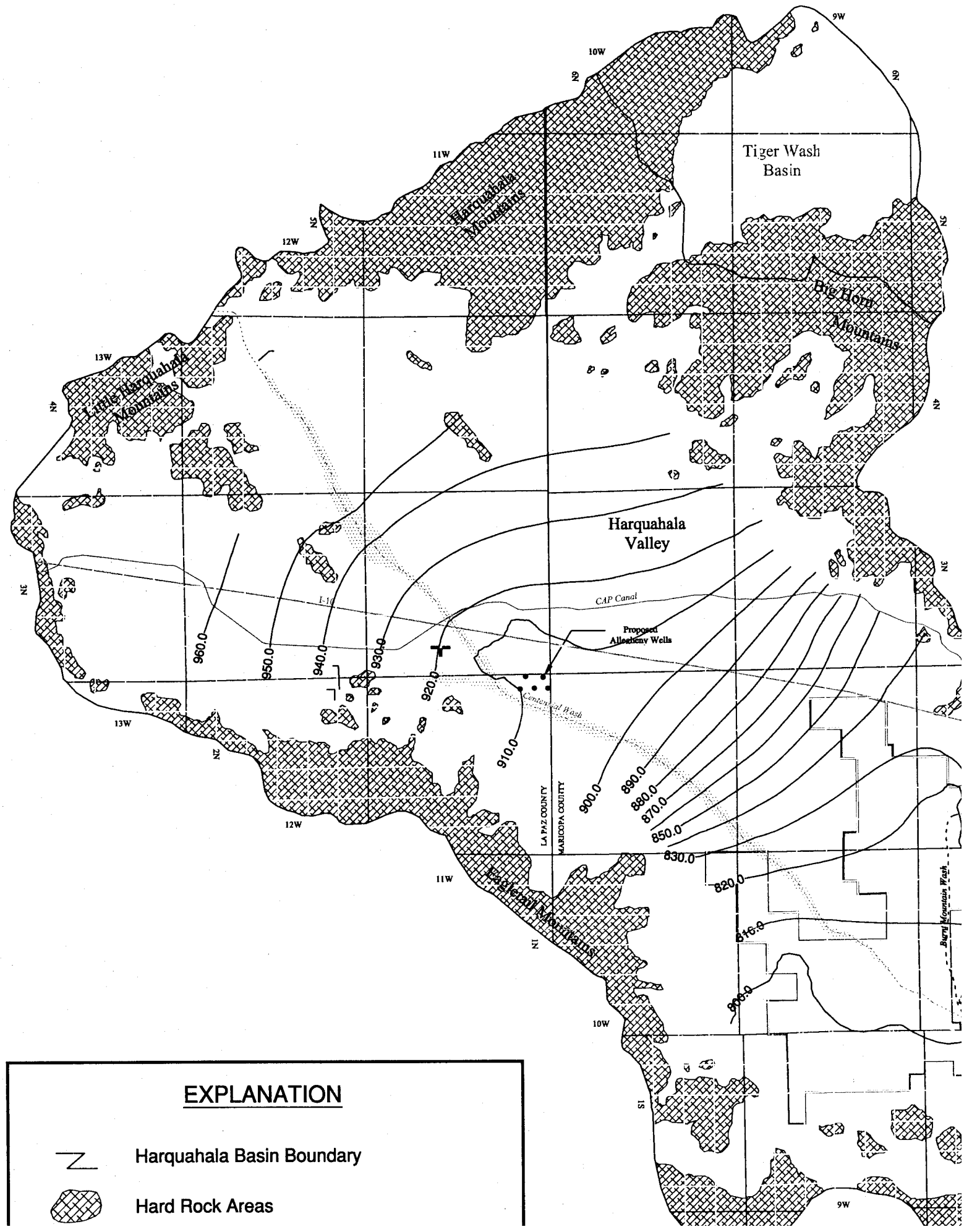
Scenario 1 is a continuation of the transient analysis from 1997 to 2032. This analysis takes into account the following assumptions:

- Time frame for the analysis: December 1997 through December 2031.
- Initial heads: December 1997 model calculated heads.
- All stresses (i.e. pumping, recharge, etc.) simulated at the end of 1997 remain constant throughout the entire simulation.
- No additional stresses are added to the system.

The purpose of Scenario 1 is to act as a "base case" to which all other scenarios can be compared. The stresses in the model from 1997 were held constant for 34 years, from 1997 through 2031. The boundary conditions and stresses at the end of the transient simulation (1997) are shown in *Table 1*. The water levels simulated in layer 1 at the end of Scenario 1 in 2031 are shown in *Figure 2*. Groundwater levels simulated in layer 1 are generally representative of water levels in both layer 1 and layer 2, therefore only one water level map is shown (HydroSystems, Inc., 1999b). Because water levels in layer 1 are representative of both layers simulated in the model, water levels from layer 1 are used when calculating impacts for all other scenarios.

Table 1. Boundaries and Stresses Used In Scenario 1

Boundaries		
	Type	Value
Harrisburg Valley	Constant Head	1300 ft elevation
Tiger Wash	Specified Flux	387 af/yr
Hassayampa Plains	Specified Flux	6630 af/yr
Palomas Valley	Specified Flux	2650 af/yr
Mullen's Cut	Specified Flux	No-Flow
Stresses		
		Value
Centennial Wash Recharge		720 af/yr
Mountain-front Recharge		110 af/yr
Agricultural Recharge		10,300 af/yr
CAP Canal Recharge		370 af/yr
Groundwater Pumping		21,210 af/yr


Tiger Wash Basin
Harquahala Mountains
Big Horn Mountains
Little Harquahala Mountains
Harquahala Valley
Proposed Allegheny Wells
CAP Canal
Centennial Wash
Eagletail Mountains
Burnt Mountain Wash
LA PAZ COUNTY
MARICOPA COUNTY
960.0
950.0
940.0
930.0
920.0
910.0
900.0
890.0
880.0
870.0
850.0
830.0
820.0
816.0
800.0
9W
10W
11W
12W
13W
1N
2N
3N
4N
5N
1S
EXPLANATION
Harquahala Basin Boundary
Hard Rock Areas

1.10 SCENARIO 2

Scenario 2 is a continuation of the transient analysis from 1997 to 2032 with the addition of pumping by Allegheny. This analysis takes into account the following assumptions:

- Time frame for the analysis: December 1997 through December 2031.
- Initial heads: December 1997 model calculated heads.
- All stresses (i.e. pumping, recharge, etc.) simulated at the end of 1997 remain constant throughout the entire simulation.
- 5 Allegheny wells added, each pumping 868 gallons per minute (gpm) beginning in 2002 and continuing through 2031.

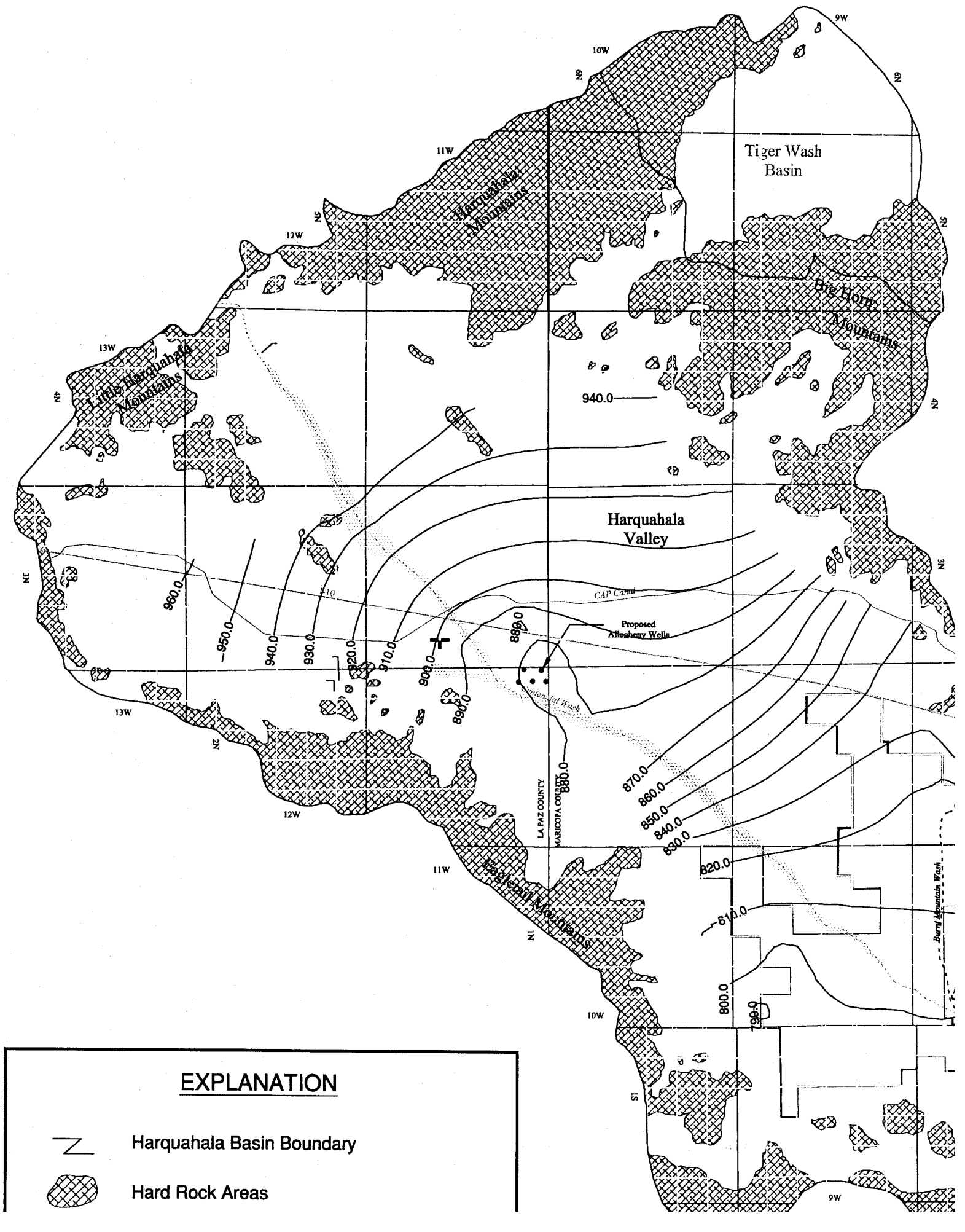
The purpose of Scenario 2 is to provide a "worst case" analysis where pumping by Allegheny is at a maximum of 7,000 ac-ft/yr, with no attempt to mitigate impacts to the aquifer. All other aspects of Scenario 2 remain the same as Scenario 1.

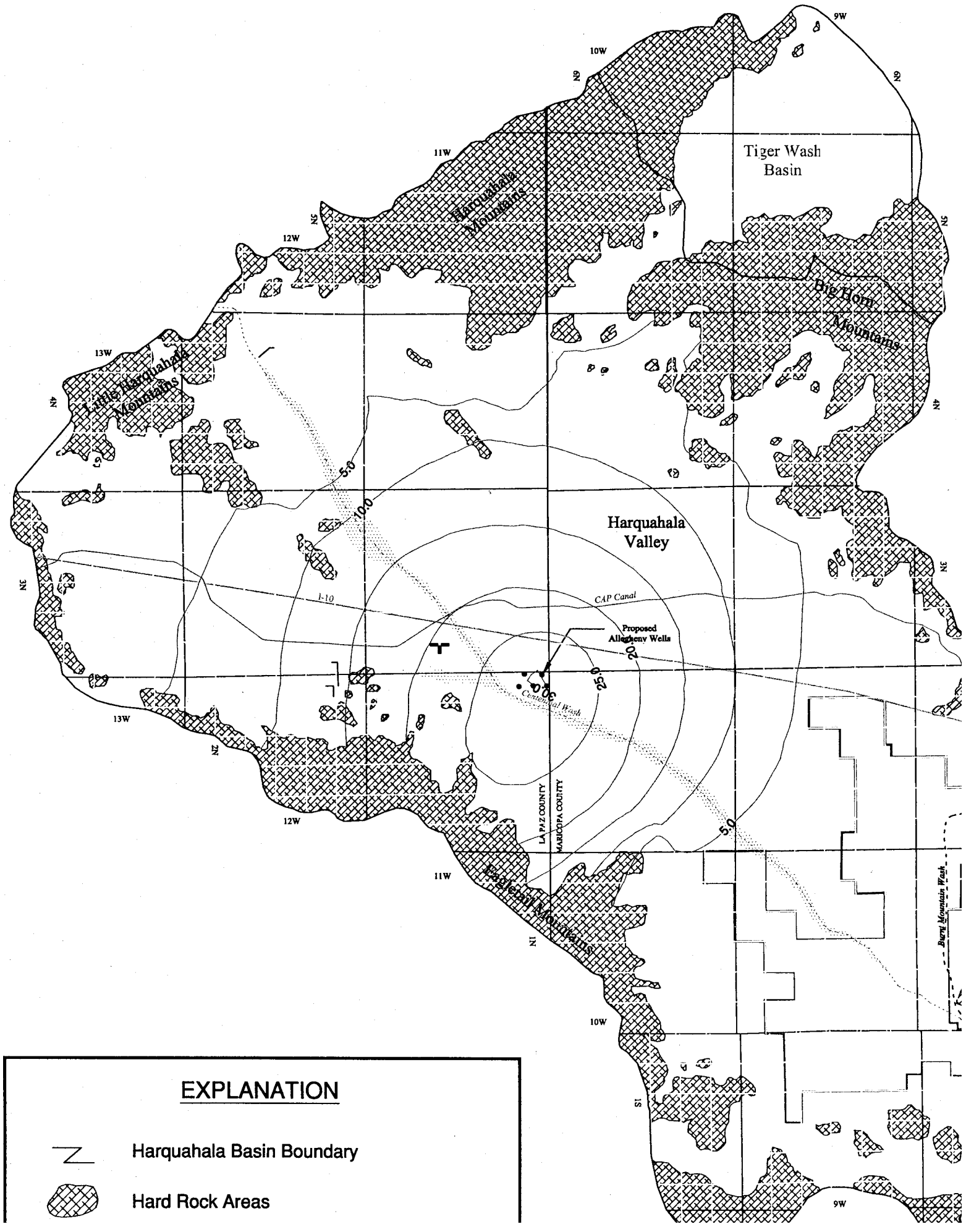
The pumping by Allegheny is attributed to 5 wells, each pumping at a rate of 868 gpm for 30 years. The wells were assumed to be screened at a depth likely to be in the LAU. These wells then are screened only in layer 2, thereby only withdrawing water from layer 2. The simulated pumping begins in 2002 and continues through 2031. The 5 new wells are located in Section 1 of Township 2 North and Range 11 West, and are arranged within Section 1 as shown below in *Figure 3.*

The simulated water levels in layer 1 after the 30 years of additional pumping are displayed in *Figure 3.* In order to determine the impact of the Allegheny wells, the water levels from layer 1, at the end of Scenario 2 were subtracted from the ending water levels from layer 1 at the end of Scenario 1. The difference between the two water levels is the impact (or drawdown) from the Allegheny wells. *Figure 4* shows the drawdown in the vicinity of the Allegheny wells.

The net impact of the Allegheny wells can be seen best by looking at *Figure 4,* which shows the drawdown, or cone of depression, caused by their pumping. The groundwater levels

drop in the vicinity of the Allegheny wells to just greater than 30 feet (30.73 feet) over the 30 year simulation period. The depth of the cone of depression is relatively shallow, but covering a wide area. This is likely due to the large hydraulic conductivities assigned to the model cells in the area of the Proposed Allegheny wells. However, compared to the historic declines in water levels witnessed in the Harquahala Valley (due to agricultural withdrawls), the Allegheny wells show relatively little impact.


Tiger Wash
Basin
Harquahala
Mountains
Big Horn
Mountains
Little Harquahala
Mountains
Harquahala
Valley
940.0
960.0
950.0
930.0
920.0
910.0
900.0
890.0
880.0
870.0
860.0
850.0
840.0
830.0
820.0
810.0
800.0
790.0
CAP Canal
Proposed
Alleghany Wells
Centennial Wash
LA PAZ COUNTY
MARICOPA COUNTY
Eagletail Mountains
Burnt Mountain Wash
EXPLANATION
Harquahala Basin Boundary
Hard Rock Areas


Tiger Wash Basin
Harquahala Mountains
Big Horn Mountains
Little Harquahala Mountains
Harquahala Valley
Proposed Allegheny Wells
CAP Canal
I-10
Centennial Wash
LA PAZ COUNTY
MARICOPA COUNTY
Eagletail Mountains
Burnt Mountain Wash
5.0
10.0
2.5
9W
10W
11W
12W
13W
1N
2N
3N
4N
5N
6N
EXPLANATION
Harquahala Basin Boundary
Hard Rock Areas

1.11 SCENARIO 3

Scenario 3 is a continuation of the transient analysis from 1997 through 2031 with the addition of pumping by Allegheny and recharge from the nearby Vidler Recharge Facility. This analysis takes into account the following assumptions:

- Time frame for the analysis: December 1997 through December 2031 .
- Initial heads: December 1997 model calculated heads.
- All stresses (i.e. pumping, recharge, etc.) simulated at the end of 1997 remain constant throughout the entire simulation.
- 5 Allegheny wells added, each pumping 868 gallons per minute (gpm) beginning in 2002 and continuing through 2031.
- Additional recharge from the Vidler Recharge Facility beginning in 2002 at 5,000 ac-ft/yr and incrementally increasing to a maximum of 70,000 ac-ft/yr in 2006, and continuing through 2031.

The purpose of Scenario 3 is to provide a "best case" analysis, where the impacts from pumping by Allegheny is minimized due to the effects of recharge from the nearby Vidler Recharge Facility. As in the previous scenarios, all stresses and boundary conditions at the end of 1997 remain constant through the 34 year simulation period until December 2031. As in Scenario 2, an additional 7,000 ac-ft/yr of pumping by Allegheny is included. Unlike the previous scenarios, Scenario 3 incorporates artificial recharge of up to 70,000 ac-ft/yr from the Vidler Recharge Facility.

Consistent with Scenario 2, the pumping by Allegheny is attributed to 5 wells, each pumping at a rate of 868 gpm for 30 years. The wells were assumed to be screened only in layer 2, thereby only withdrawing water from layer 2. The simulated pumping begins in 2002 and continues through 2031. The 5 new wells are located in Section 1 of Township 2 North and Range 11 West and are arranged within Section 1 as shown previously in *Figure 2.*

The Vidler Recharge Facility is located near the proposed Allegheny site, in Section 33 of Township 3 North and Range 11 West. The recharge facility is permitted for a maximum recharge volume of 100,000 ac-ft/yr. However, as part of the permit application for a full scale Underground Storage Facility (USF), the modeled recharge volume was a maximum of 70,000 ac-ft/yr (HydroSystems, Inc., 1999a). In order to be consistent with this permitting effort, the same 70,000 ac-ft/yr was used as a maximum. Although the recharge facility is permitted for 100,000 ac-ft/yr, it is likely that this volume will not be recharged in the first few years of operation. In order to simulate a likely recharge scenario, recharge volumes were increased incrementally beginning in 2002 and ending in 2006. The maximum simulated recharge volume of 70,000 ac-ft/yr, reached in 2006, was continued through the end of Scenario 3 (December 2031). *Table 2* displays the simulated recharge schedule for Scenario 3.

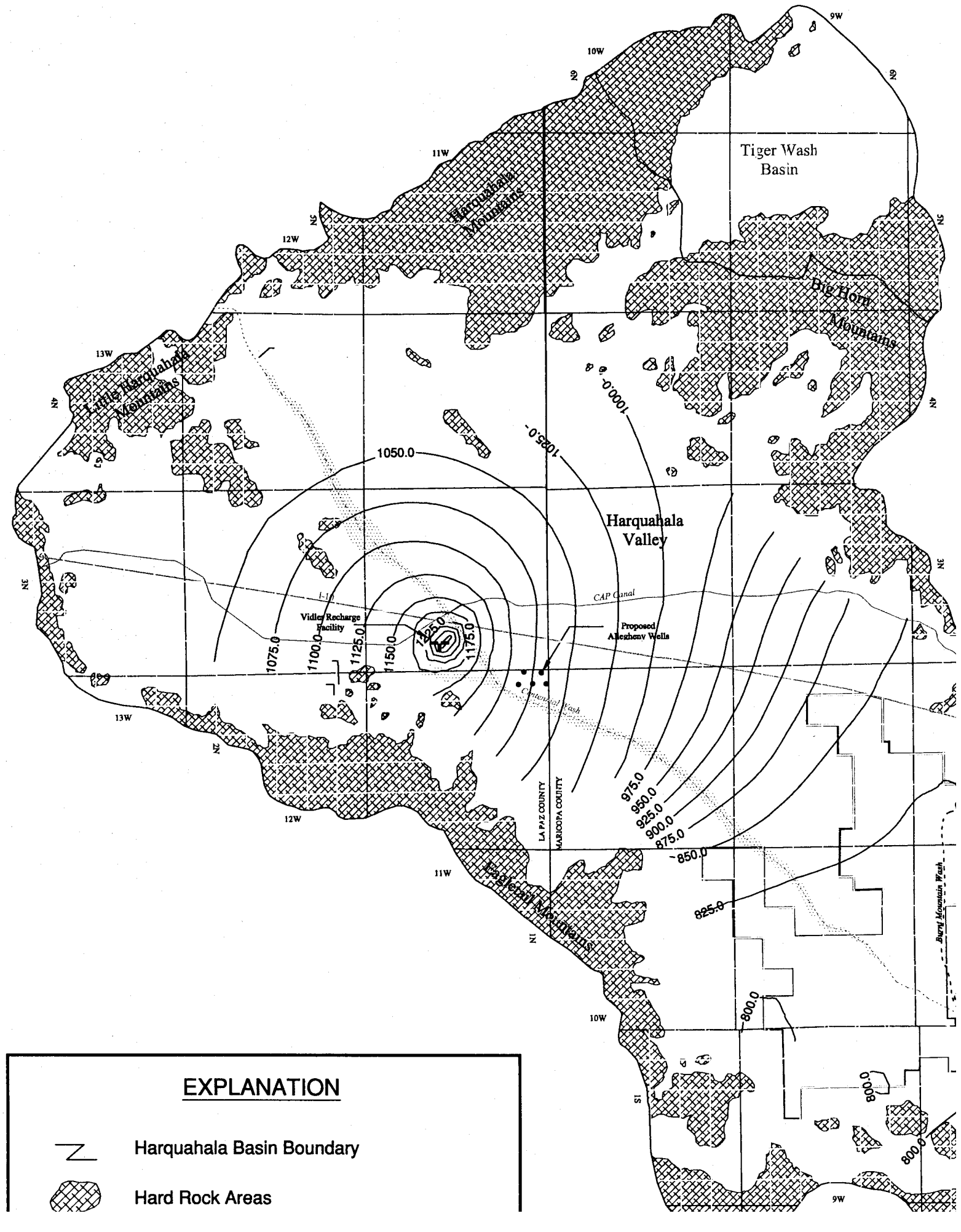
The simulated water levels in layer 1 after the 30 years of additional pumping and recharge are displayed in *Figure 5*. As in Scenario 2, the impact of the Allegheny wells was determined by subtracting the water levels from layer 1, at the end of Scenario 3 from the water levels from layer 1 at the end of Scenario 1. The difference between the two water levels is the impact (or drawdown) from the Allegheny wells. *Figure 6* shows the drawdown in the vicinity of the Allegheny wells. It is important to note that the drawdown shown in *Figure 6* is negative, thus indicating a rise in water level. The effects of pumping by Allegheny are not apparent when considered with the large volume of water recharged by Vidler Water Company.

Table 2. Vidler Recharge Facility Proposed Recharge Schedule

Year	Recharge Quantity (acft/yr)	Recharge Quantity (ft^3/yr)	Recharge Quantity (ft^3/day)	Recharge Rate (ft/day)	Recharge Rate (ft/s)
2002	5000	2.178E+08	596712.33	0.03395	3.9297E-07
2003	10000	4.356E+08	1193424.66	0.06791	7.8594E-07
2004	25000	1.089E+09	2983561.64	0.16976	1.9649E-06
2005	50000	2.178E+09	5967123.29	0.33953	3.9297E-06
2006	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2007	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2008	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2009	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2010	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2011	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2012	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2013	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2014	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2015	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2016	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2017	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2018	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2019	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2020	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2021	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2022	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2023	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2024	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2025	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2026	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2027	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2028	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2029	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2030	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2031	70000	3.049E+09	8353972.60	0.47534	5.5016E-06
2032	70000	3.049E+09	8353972.60	0.47534	5.5016E-06

The most striking impact apparent in *Figure 6* is observed in the vicinity of the Vidler Recharge Facility and not near the proposed wells of Allegheny. Because of the simulation of large volumes of recharge water entering the Vidler Recharge Facility, impacts from the pumping at the Allegheny wells are virtually negligible. Although the items of concern in this report are the impacts from Allegheny wells, the degree of the impacts are very much dependent upon the recharge capabilies of the Vidler Recharge Facility.

It is important to note also that although Scenario 3 included recharge at the Vidler Recharge Facility did not include any recovery of that recharged water. The positive impacts of the recharge facility would be significantly reduced if recovery of the recharged water were taken into account. Consequently, the impacts of Allegheny groundwater pumping would be more apparent.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Harquahala Mountains
Big Horn Mountains
Little Harquahala Mountains
Harquahala Valley
I-10
CAP Canal
Vidler Recharge Facility
Proposed Alexcnav Wells
Centennial Wash
LA PAZ COUNTY
MARICOPA COUNTY
Eagle Tail Mountains
Burnt Mountain Wash
1050.0
1075.0
1100.0
1125.0
1150.0
1175.0
1000.0
975.0
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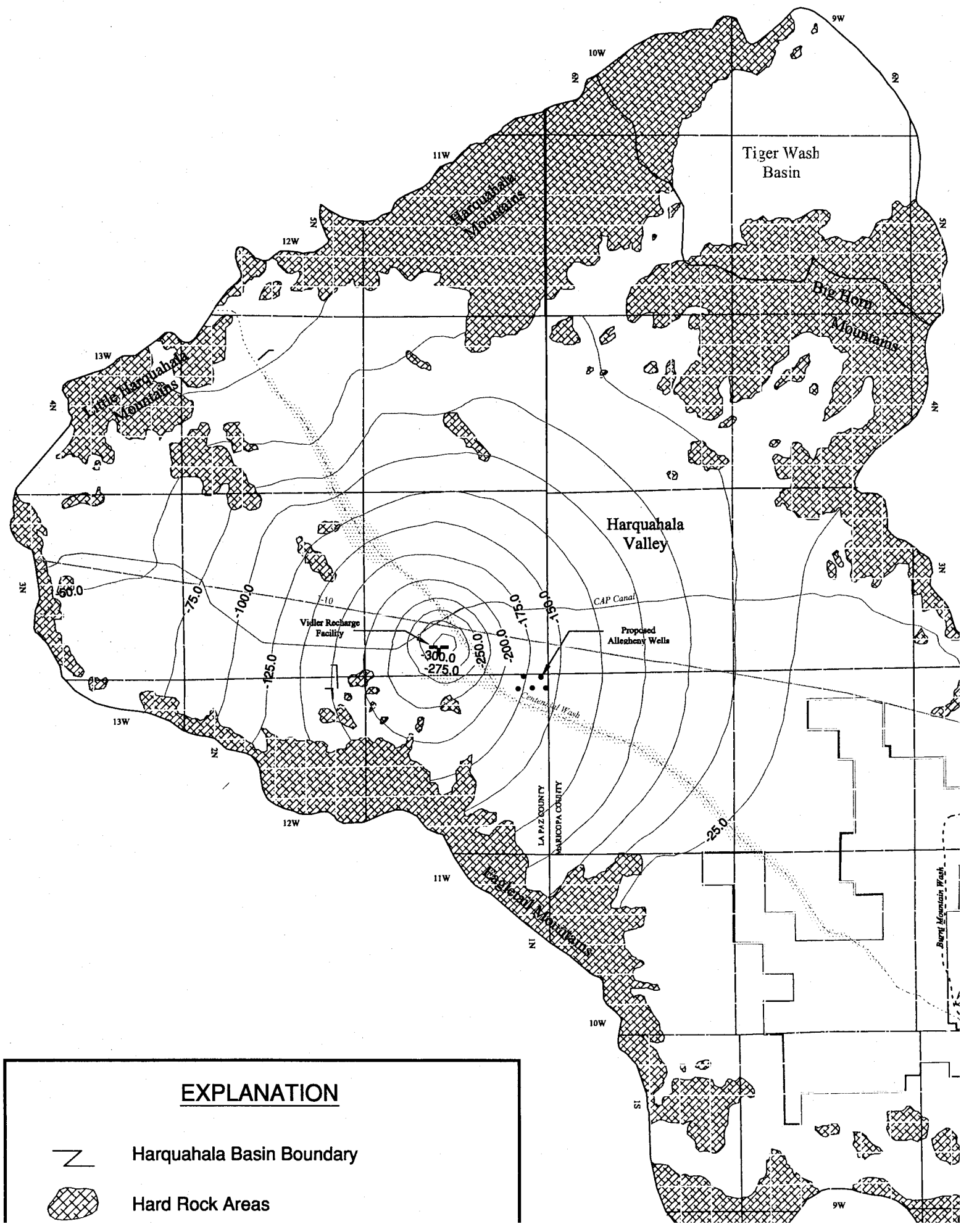
EXPLANATION
Harquahala Basin Boundary
Hard Rock Areas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Eagletail Mountains
CAP Canal
Vidler Recharge Facility
Proposed Allegheny Wells
Centennial Wash
Burnt Mountain Wash
LA PAZ COUNTY
MARICOPA COUNTY
-50.0
-75.0
-100.0
-125.0
-150.0
-175.0
-200.0
-225.0
-250.0
-275.0
-300.0
-25.0
9W
10W
11W
12W
13W
1N
2N
3N
4N
5N
6N
1S
EXPLANATION
Harquahala Basin Boundary
Hard Rock Areas

1.12 SUMMARY AND CONCLUSIONS

Looking at the best circumstance, because of the potentially large volume of recharge water entering the Vidler Recharge Facility, impacts of pumping from Allegheny wells are virtually negligible. However, it is important to note that the simulation including recharge at the Vidler Recharge Facility did not include any recovery of that recharged water. The impacts of the recharge facility would be subdued if recovery of the recharged water were taken into account. Consequently, the impacts of Allegheny groundwater pumping would be more apparent.

On the other hand, looking at the less ideal circumstance where recharge is not taken into account, the maximum drawdown by the Allegheny wells was calculated to be less than 31 feet (30.73 feet). Over a 30 year time span, this drawdown is not a significant impact to the groundwater system, especially considering the historic groundwater declines due to agricultural pumping within Harquahala Valley.

The simulated impacts of groundwater pumping by Allegheny in both Scenarios 2 and 3 are extreme, and they bracket a range of more likely possibilities. The negative impacts of the Allegheny wells being a drawdown of nearly 31 feet is reasonable. The positive impacts, although not governed by Allegheny, are an increase in water levels of greater than 175 feet in the vicinity of the proposed pumping wells. The most realistic impact in the area of the Allegheny pumping would likely fall within these "best" and "worst case" scenarios.

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EXHIBIT C—AREAS OF BIOLOGICAL WEALTH

EXHIBIT C – AREAS OF BIOLOGICAL WEALTH

As stated in Arizona Corporation Commission Rules of Practice and Procedure 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 the effects, if any, the proposed facilities will have thereon."

RESOURCE OVERVIEW

The project area includes all of Section 1, T2N, R11W and the SW1/4 of (160 acres) and S1/2, SE1/4 (80 acres) of Section 35, T3N, R 11W. The area and the surrounding vicinity currently are used for desert grazing and support three native vegetation communities, including creosote bush (*Larrea tridentata)* flats, xeroriparian areas, and ephemeral wetlands. The majority of the plant cover in both sections is creosote bush with individual crucifixion thorn (Castela emoryi) and a heavily grazed mix of native and exotic annuals. Surrounding areas also include agricultural lands that are actively farmed.

SUMMARY

The proposed project would not result in adverse impacts on the biological wealth within the area. Endangered wildlife species would not be adversely affected by the construction of the proposed project. Rare or endangered plant species would not be adversely affected by the construction of the proposed project.

INVENTORY METHODS

The inventory of areas of biological wealth included review of aerial photography, field reconnaissance, review of rare and endangered species lists for the project area, and surveys for endangered species. The area was flown for aerial photography in March 2001. Field reconnaissance occurred during multiple site visits from February through May 2001. Correspondence was sent in April 2001 to the United States Fish and Wildlife Service (USFWS) and Arizona Game and Fish Department (AGFD) requesting information on special status species (threatened, endangered, and state species of concern) within the project vicinity. Documents from USFWS and AGFD that provide information on special status species potentially occurring in the vicinity of the proposed project are presented in Attachments C-1 and C-2, respectively. Specific surveys for endangered species potentially occurring in the project area began in February 2001, and will continue until Spring 2002.

INVENTORY RESULTS

Generating Facility and Surrounding Area

The generating facility and evaporation ponds would be located in SW1/4 of (160 acres) and S1/2, SE1/4 (80 acres) of Section 35, T3N, R11W. This area, though partially within the Centennial Wash 100-year floodplain, is primarily a creosote bush (*Larrea tridentata)* flat, a vegetative community typical to desert areas. The northern boundary of this half-section is sparsely vegetated, likely due to previous clearing for a landing strip. The southern boundary of Section 35 has a 100-foot-wide band of xeroriparian community. Similar to the south half of Section 35, Section 1, T2N, R11W predominantly contains creosote flats. However, the southwest corner of section 1 is a well-developed xeroriparian community that is part of Centennial Wash. The dominant species are Mesquite (*Prosopis sp*), Tamarisk (*Tamarix pentandra*), Wolfberry (*Lycium macrodon*), and Arrowweed (*Pluchea purpurascens*). There is a diverse

understory to the Centennial Wash xeroriparian community that is made up of mallow and mustards. This area remains wet for much of the year. The varying densities of xeroriparian vegetation reflect the availability of water.

An ephemeral wetland has developed within an irrigation return basin that is located along the west boundary of Section 1. This 20-foot-deep trench collects rainwater and runoff from agricultural fields to the west. Water stands at the site long enough to create a plant free bed. Because of the mesic conditions present, it contains more typical wetland vegetation. Arrowweed (*Pluchea sericea*), cattails (*Typha angustifolia*), and tamarisk are common.

Though the area surrounding the proposed transmission line interconnect is predominantly creosote bush, the areas also includes a fourth plant community – agricultural land. The agricultural areas are cleared and plowed, and some areas are planted while others are fallow. The fallow areas support dense stands of exotics such as mustard (*Sisumbrium sp.*) and thistle (*Salsola iberca*). The proposed route follows a dirt road servicing agricultural lands. The raised dirt road has caused water to gather in places. This, in turn, has encouraged the growth of arrowweed and scattered mesquite and tamarisk trees.

The approximately 20-acre area identified for the proposed switchyard adjacent to the existing PaloVerde-Devers 500kV line is located in Sections 24 and 25 (T3N, R11W). The area is a creosote bush community. Widely scattered crucifixion thorn and cholla cactus also are present.

Special Status Species

Special status wildlife and plant species that potentially occur within the project area are listed in Table C-1. These include species listed as endangered or threatened under the Endangered Species Act, Wildlife of Special Concern identified by AGFD, and Highly Safeguarded Plants protected by the Arizona Native Plant Law. Information was acquired from the USFWS, AGFD, and Arizona Department of Agriculture, respectively.

Twenty-five species of plants and animals are listed by various government agencies as threatened, endangered, or of special concern. The project area may provide habitat for some of these special status animals and plants. These include the Southwest Willow Flycatcher (*Epidonax traillii extimus*), the Sonoran Desert Tortoise (*Gopherus agassizii*), and the Cactus Ferruginous Pygmy Owl (*Glaucidium brazilianum cactorum*). Surveys for these three species are being conducted in accordance with agency-established guidelines and protocols. Xeroriparian areas may provide habitat for the cactus ferruginous pygmy-owl. The first of two years of owl surveys were conducted by URS during 2001.

Other species that may occur in the area but that are not expected to use the site in a significant manner are listed below with a brief description of their respective habitat requirements.

Mammals

Lesser long-nosed bats (*Leptonycteris curasoae yerbabuenae*) forage on nectar from saguaro and agave blooms. These forage species do not occur at the proposed generating facility site. California leaf-nosed bats (*Macrotus californicus*) may glean insects off the ground or from the vegetation especially within the xeroriparian areas, where insects are relatively abundant. No known bat roosts are present in proximity to the proposed facilities.

Birds

Ferruginous hawks (*Buteo regalis*) and peregrine falcons (*Falco peregrinus anatum*) may forage throughout the project area. No cliffs or ledges are located within the immediate project vicinity; therefore no nesting habitat suitable for these species is present. Mountain plovers (*Charadrius montanus*) potentially could be found in agricultural fields during winter. The irrigation return basin to the west of the site provides habitat for additional special status species. These wetland areas may attract many species of birds. Great egret (*Ardea alba*) and snowy egret (*Egretta thula*) may visit the area during migration. Yuma clapper rail (*Rallus longirostris yumanensis*) may be found in the vicinity of the wetlands but only as transient species. Southwestern willow flycatchers (*Empidonax trailli extimus*) may also visit the site; field surveys are being conducted during the spring and summer months of 2001.

Reptiles and Amphibians

Arizona skinks (*Eumeces gilberti Arizonans),* Mojave fringe-toed lizard (*Uma scoparia*) and Banded Gila monster (*Heloderma suspectum*) also may be found in the project area. The wetland habitats may support Sonoran mud turtles (*Kinosternon sonoriense*), the Arizona toad (*Bufo microscaphus*) and lowland leopard frogs (*Rana yavapaiensis*).

Fish

No permanent water exists on the site. Therefore no fish species are present.

Plants

Special status plant species that may occur in the project area include Hohokam agave (*Agave murpheyi*), crested saguaro (*Carnegiea gigantea*), and acuna cactus (*Echinomastus erectocentrus acunensis*). The Hohokam agave and acuna cactus are not expected to occur within the project area and none were observed during site visits. Crested saguaros are a rare growth form caused by freezing or mechanical injury of a saguaro's apical meristem (Steenbergh and Lowe 1983). No saguaros were found on or near the site.

ASSESSMENT METHODOLOGY

Potential effects of the proposed facilities on areas of biological wealth are assessed by determining whether the communities present are unique or provide habitat for special status species, and how the proposed facilities may alter those biological communities.

ASSESSMENT RESULTS

Construction of the proposed generating facility, pipeline lateral, switchyard, and transmission line interconnect all would result in vegetation clearing and habitat loss, and could involve disturbance and potential injury or mortality of wildlife. The proposed transmission line interconnect also would involve potential avian collision hazard.

Clearing of vegetation would affect areas within terrestrial environments described previously, predominantly the creosote bush community. No ground disturbance would be anticipated in the wetland along the western boundary of Section 1, or in the xeroriparian area of Centennial Wash in Section 1. Approximately 120 to 160 acres of primarily creosote community would be cleared in the south half of Section 35 to build the generating facility. The southern boundary xeroriparian community also would be disturbed. Construction staging in Section 1 would cause temporary disturbance to additional areas of

creosote. Wells and water pipelines would be located throughout Section 1, causing mostly temporary damage to plants and animals associated with the creosote flats. No wells are planned for the xeroriparian area of Section 1; therefore no disturbance to that area is anticipated.

Clearing and construction activities would result in loss of foraging habitat for raptors and possibly wintering mountain plovers. Creosote areas are common in the project area and generally are characterized by low biodiversity. Installation of the proposed pipeline lateral would require minimal disturbance at the edge of the mesquite bosque. Damage to the dense areas of the bosque would be avoided by boring under the wash.

The proposed transmission line interconnect route runs directly north, crossing Interstate 10 and intersecting the Palo Verde-Devers 500kV transmission line. The route travels along a farm road separating blocks of private and State lands. The areas adjacent to the road are heavily disturbed by grazing activities and active cultivation. Construction of the proposed transmission line interconnect would cause temporary disturbance but would not impact any native vegetation.

Temporary disturbance of wildlife would occur in the proximity of construction activities associated with the proposed generating facility, transmission line interconnect, switchyard, and pipeline lateral. Areas particularly sensitive to such disturbance are those areas where wildlife congregate, such as wetlands and xeroriparian areas. Special status species found at the irrigation return basin may be disturbed by noise from construction activities in Section 35. Such disturbance may cause birds to temporarily leave the basins. However, the irrigation return basin does not provide typical nesting habitat for special status bird species. Yuma clapper rail and southwestern willow flycatcher would be present as transient species only and would not likely be affected by construction-generated noise. Noise disturbance may interrupt foraging and breeding behaviors of aquatic reptiles and amphibians, such as the Sonoran mud turtle and lowland leopard frog.

Installation of the proposed pipeline lateral and transmission line interconnect also would cause temporary disturbance of wildlife in the proximity of construction. Work activities at dawn or dusk may temporarily disturb and displace foraging bats. Due to the absence of saguaros along the proposed pipeline lateral route the probability of disturbing foraging lesser long-nosed bats would be low. With the possible exceptions of the cactus ferruginous pygmy-owl and the southwestern willow flycatcher, terrestrial environments in the project area do not provide nesting habitat for any of the special status bird species. Both of these potentially occurring species are largely confined to the mesquite bosque (xeroriparian habitat associated with Centennial Wash). Birds foraging in the project area may be temporarily displaced during construction. Habitat conditions for the pygmy-owl are somewhat marginal and owls were not detected during year one of intensive surveys in the area. Similar surveys of southwestern willow flycatcher habitat have been initiated; preliminary results are also negative. Based on the preliminary survey results and the low likelihood of these species occurring, no effects on these species are anticipated from project construction and operation.

Another construction-related effect is the potential for incidental injury or mortality of small animals and removal of protected plant species in the path of construction equipment. Special status species most susceptible to these impacts include the Sonoran desert tortoise and Arizona skink. Construction monitoring would reduce potential adverse effects on these species, especially desert tortoise, which is more easily observed and has identifiable burrows. Plants protected under the Arizona Native Plant Law would be identified within construction areas, and the Arizona Department of Agriculture would be notified prior to construction of any required salvage activities.

Birds in the project area could be injured or killed by colliding with conductors of the proposed transmission line interconnect. Larger birds, such as eagles, hawks, and waterfowl are more vulnerable to

collision hazard than smaller birds (Faanes 1987). Special status species that may be affected include bald eagle, ferruginous hawk, osprey, and black-bellied whistling duck.

CONCLUSIONS

The proposed project would not result in adverse impacts on the biological wealth within the area. The biological wealth of the project site was inventoried using existing material such as scientific and government literature, map, and aerial photographs. Field visits were made from February through June 2001. Surveys in the appropriate habitats were conducted for the endangered cactus ferruginous pygmy-owl and southwestern willow flycatcher following USFWS protocols. Surveys for Sonoran desert tortoise following guidelines from the Arizona Game and Fish Department were also carried out. None of these species was detected. While temporary disruption of wildlife activities in adjacent habitats may occur during construction, the potential is small and transient. The death of burrowing rodents and reptiles caused by construction activities are not considered significant due to the populations and lack of special status for these species. Endangered wildlife species will not be adversely affected by the construction of the proposed project.

Plant communities were identified and searches for rare or endangered plants were conducted. No rare or endangered plant species were identified. The plant communities that will suffer permanent loss due to plant construction are widespread and not critical to any species listed by government agencies as species of special concern. Rare or endangered plant species will not be adversely affected by the construction of the proposed project.

TABLE C-1
SPECIAL STATUS SPECIES OF PLANTS AND ANIMALS THAT MAY OCCUR IN THE PROJECT VICINITY

Common Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Environmental Type Likely to be Present			
			Creosote Bush Flats	Xero-riparian Wash	Wetlands	Agriculture Lands
BIRDS						
American bittern (*Botaurus lentiginosus*)		SC			✔	
Least bittern (*Ixobrychus exilis*)		SC			✔	
Great egret (*Ardea alba*)		SC			✔	
Snowy egret (*Egretta thula*)		SC			✔	
Black-bellied whistling duck (*Dendrocygna autumnalis*)		SC			✔	
Osprey (*Pandion haliaetus*)		SC			✔	
Bald eagle (*Haliaeetus leucocephalus*)	T	SC		✔	✔	✔
Ferruginous hawk (*Buteo regalis*)		SC	✔	✔		✔
American peregrine falcon (*Falco peregrinus anatum*)		SC	✔	✔	✔	✔
Yuma clapper rail (*Rallus longirostris yumanensis*)	E	SC			✔	

TABLE C-1
SPECIAL STATUS SPECIES OF PLANTS AND ANIMALS THAT MAY OCCUR IN THE PROJECT VICINITY

Common Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Environmental Type Likely to be Present			
			Creosote Bush Flats	Xero-riparian Wash	Wetlands	Agriculture Lands
Snowy plover (*Charadrius alexandrinus*)		SC			✔	
Mountain plover (*Charadrius montanus*)	C					✔
Cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*)	E	SC		✔		
Belted kingfisher (*Ceryle alcyon*)		SC			✔	
Southwestern willow flycatcher (*Empidonax trailli extimus*)	E	SC		✔	✔	
MAMMALS						
California leaf-nosed bat (*Macrotus californicus*)		SC		✔		
Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*)	E	SC	✔	✔		
Southern yellow bat (*Lasiurus ega*)		SC		✔	✔	
Spotted bat[4] (*Euderma maculatum*)		SC	✔	✔	✔	
REPTILES AND AMPHIBIANS						
Sonoran mud turtle (*Kinosternon sonoriense*)	C				✔	
Lowland leopard frog (*Rana yavapaiensis*)		SC			✔	
Desert tortoise (*Gopherus agassizii*)		SC		✔		
Arizona skink (*Eumeces gilberti arizonensis*)		SC				
Mexican garter snake (*Thamnophis eques*)		SC			✔	
PLANTS						
Hohokam agave (*Agave murpheyi*)		HS				
Crested or Fan-top saguaro (*Carnegiea gigantea*)		HS	✔	✔		
Acuna cactus (*Echinomastus erectocentrus acunensis*)	C	HS				

TABLE C-1
SPECIAL STATUS SPECIES OF PLANTS AND ANIMALS THAT MAY OCCUR IN THE PROJECT VICINITY

Common Name (*Scientific Name*)	Federal Status[1]	State Status[2]	Environmental Type Likely to be Present			
			Creosote Bush Flats	Xero-riparian Wash	Wetlands	Agriculture Lands

Key to Table C-1:
Federal Status: E = Endangered T = Threatened C = Candidate
State Status: SC = Special Concern HS = Highly Safeguarded

[1]Source: U.S. Fish and Wildlife Service 1999 and U.S. Fish and Wildlife Service 1997.
[2]Sources: Arizona Game and Fish Department 1996 and Arizona Department of Agriculture 1999
[3]Potential presence of species based on the following sources: Monson and Phillips 1981, Hoffmeister 1986, Stebbins 1985, and Kearney and Peebles 1960.
[4] Habitat requirements for the spotted bat are not well known, but appear to include cliffs and rocks (Hoffmeister 1986).

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ATTACHMENT C-1—ARIZONA GAME AND FISH DEPARTMENT LETTER

URS

7720 North 16th Street
Suite 100
Phoenix, Arizona 85020
602 371 1100 Tel
602 371 1615 Fax

April 10, 2001

John Kennedy
Project Evaluation Program Supervisor, Habitat Branch
Arizona Game and Fish Department
2221 West Greenway Road
Phoenix, AZ 85023-4399

Dear Mr. Kennedy:

Allegheny Energy Supply Company, L.L.C. (Allegheny) is planning to construct a 1,080-megawatt (MW) natural gas-fired generating facility in La Paz County, Arizona. The generating facility would be a "merchant plant," which means it would operate without long-term power contracts for the purpose of selling power on the wholesale electric market. The generating facility would be located on private undeveloped land and would interconnect with the regional grid via a 500-kilovolt (kV) transmission line tying the existing Palo Verde-Devers 500kV transmission line approximately 2 to 3 miles north of the generating facility site. Additional facilities needed to operate the plant include one natural gas pipeline lateral, one water pipeline for transporting cooling water to a discharge area, and possibly evaporation ponds where cooling water would be discharged (though alternatives that do not require evaporation ponds, e.g., groundwater recharge, are being considered). The gas pipeline lateral would interconnect with the existing El Paso Natural Gas pipeline corridor approximately 3 to 4 miles south of the generating facility site. The cooling water pipeline would transport water that had cycled through the plant to an existing recharge well or evaporation ponds that would be located approximately 0.5 to 1 mile northwest of the plant site.

The generating facility site (SW 1/4, SEC 1, T2N, R11W) is located approximately 1.5 miles south of Exit 69 along Interstate 10, approximately 75 miles west of downtown Phoenix, Arizona. A map of the project site and surrounding area is attached. The generating facility is located on relatively undisturbed desert scrub landscape along the north side of Centennial Wash. The surrounding project area consists of a combination of undisturbed desert scrub and agricultural areas, as well as a dense mesquite bosque associated with Centennial Wash. There are several distant mountain ranges surrounding the project area including the Little Harquahala Mountains

approximately 12 miles to the northwest, Big Horn Mountains approximately 10 miles to the northeast, and the Eagletail Mountains approximately 5 miles to the southwest. The Eagletail Mountain Wilderness boundary encopasses the mountains as well as several miles of desert to the south of the project area.

At this time, I would like to request information from your Heritage Data Management System on rare species, threatened and endangered species (listed and proposed for listing), and species of special concern within each study area. If possible, I would like to have a list of these species that may occur within the study area. I have attached a map for reference. In addition, if there is a representative of AGFD that should be notified regarding the siting process and any upcoming public meetings, please contact me with that information. If you have any questions or problems with my request, I can be reached at (602) 371-1100, or via e-mail at jennifer_baker@urscorp.com. Thank you for your assistance.

Sincerely,

Jennifer Baker
Environmental Planner

attachment

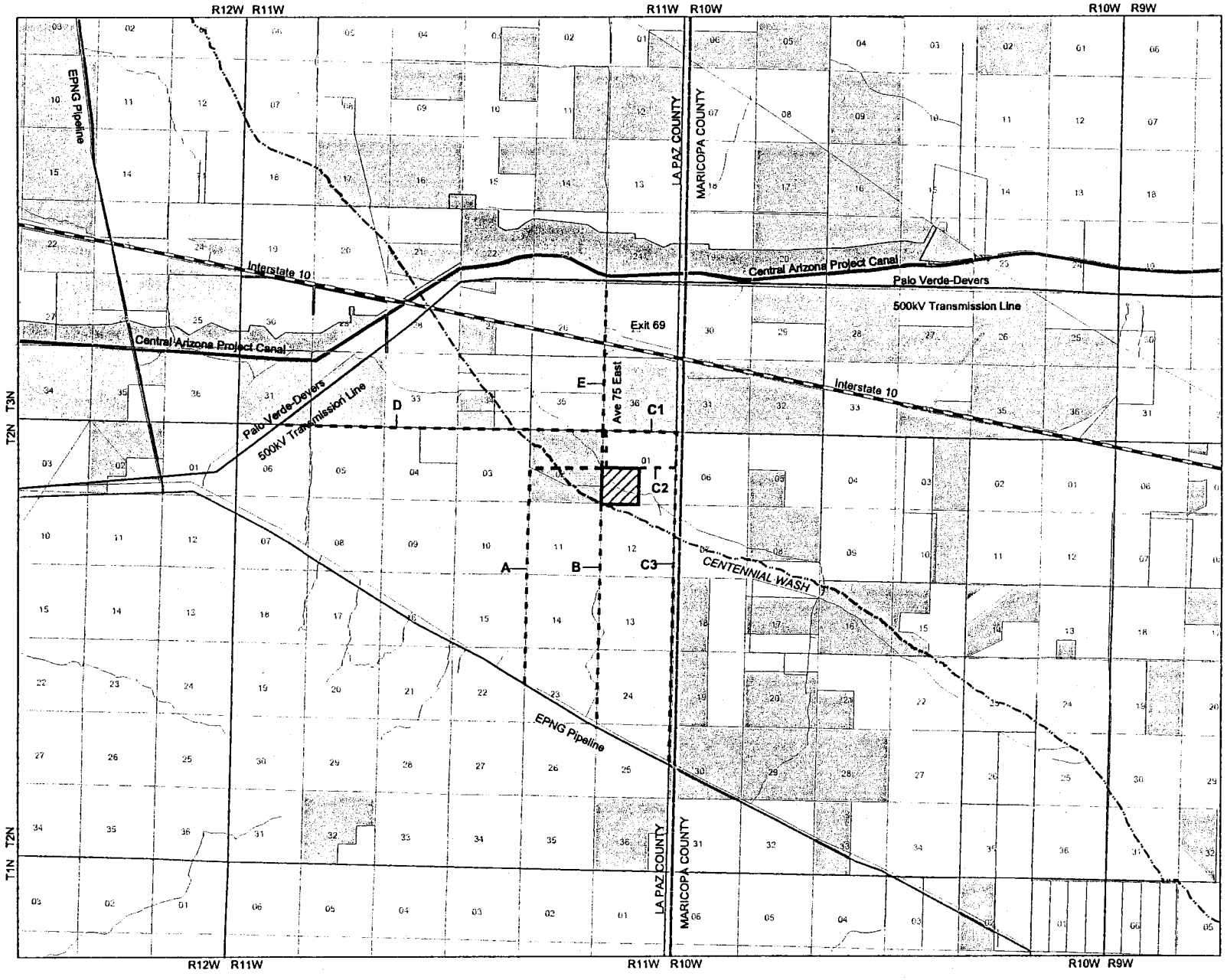

Exhibit A-2
Ownership and Jurisdiction Map

La Paz Generating Facility
Allegheny Energy
Supply Company, LLC

Legend

- Bureau of Land Management
- State Trust Lands
- Private Lands
- Bureau of Reclamation
- Central Arizona Project Canal
- Generation Facility Site
- Township and Range Lines
- Section Lines
- County Boundary
- Major Roads
- Minor Roads
- Centennial Wash
- Gas Pipeline Lateral Alternatives
- EPNG Pipeline
- 500kV Transmission Line Alternatives
- Palo Verde-Devers 500kV Transmission Line

Note:
Only one gas pipeline alternative and one transmission line alternative will be constructed.

Source:
Ownership: Arizona State Land Dept., 1996.

Working Draft 03/28/01

N
W E
S

Scale In Miles
0 0.5 1 1.5 2

URS

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
2221 WEST GREENWAY ROAD, PHOENIX, AZ 85023-4399
(602) 942-3000 • WWW.AZGFD.COM

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April 18, 2001

APR 23 2001
RECEIVED

Ms. Jennifer Baker
URS
7720 North 16th St.
Suite 100
Phoenix, AZ 85020

Re: Special Status Species Information for **Township 2 North, Range 11 West, Sections 1-6, 11-14, 23-25; Allegheny Energy Supply Company Natural Gas-fired Generating Facility and Pipelines.**

Dear Ms. Baker:

The Arizona Game and Fish Department (Department) has reviewed your letter, dated April 10, 2001, regarding special status species information associated with the above-referenced project area. The Department's Heritage Data Management System (HDMS) has been accessed and current records show that the special status species listed on the attachment have been documented as occurring in the project area. In addition, this project does not occur in the vicinity of any proposed or designated Critical Habitats.

The Department's HDMS data are not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity.

Making available this information does not substitute for the Department's review of project proposals, and should not decrease our opportunities to review and evaluate new project proposals and sites. The Department is also concerned about other resource values, such as other wildlife, including game species, and wildlife-related recreation. The Department would appreciate the opportunity to provide an evaluation of impacts to wildlife or wildlife habitats associated with project activities occurring in the subject area, when specific details become available.

If you have any questions regarding the attached species list, please contact me at (602) 789-3618. General status information and county distribution lists for special status species are also available on our web site at http://www.azgfd.com/frames/fishwild/hdms_site/Home.htm.

Sincerely,

Sabra S. Schwartz
Heritage Data Management System, Coordinator

SSS:ss

Attachment

cc: Bob Broscheid, Project Evaluation Program Supervisor
Russ Engel, Habitat Program Manager, Region IV

AGFD #04-13-01 (11)

Special Status Species within 5 miles of T2N,R11W Sec 1-6, 11-14, 23-25

Arizona Game and Fish Department, Heritage Data Management System

April 18, 2001

Scientific Name	Common Name	ESA	USFS	BLM	WSCA	NPL
GOPHERUS AGASSIZII (SONORAN POPULATION)	SONORAN DESERT TORTOISE	SC			WC	

No Critical Habitats in project area; AGFD #04-13-01 (11), Allegheny Energy Supply Company Natural Gas-fired Generating Facility and Pipelines.

STATUS DEFINITIONS

ARIZONA GAME AND FISH DEPARTMENT (AGFD)
HERITAGE DATA MANAGEMENT SYSTEM (HDMS)

FEDERAL US STATUS

ESA **Endangered Species Act** (1973 as amended)
US Department of Interior, Fish and Wildlife Service (http://arizonaes.fws.gov)

Listed

- LE Listed Endangered: imminent jeopardy of extinction.
- LT Listed Threatened: imminent jeopardy of becoming Endangered.
- XN Experimental Nonessential population.

Proposed for Listing

- PE Proposed Endangered.
- PT Proposed Threatened.

Candidate (Notice of Review: 1999)

- C Candidate. Species for which USFWS has sufficient information on biological vulnerability and threats to support proposals to list as Endangered or Threatened under ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity.
- SC Species of Concern. The terms "Species of Concern" or "Species at Risk" should be considered as terms-of-art that describe the entire realm of taxa whose conservation status may be of concern to the US Fish and Wildlife Service, but neither term has official status (currently all former C2 species).

Critical Habitat (check with state or regional USFWS office for location details)

- Y Yes: Critical Habitat has been designated.
- P Proposed: Critical Habitat has been proposed.

[\N No Status: certain populations of this taxon do not have designated status (check with state or regional USFWS office for details about which populations have designated status)].

USFS **US Forest Service** (1999 Animals, 1999 Plants)
US Department of Agriculture, Forest Service, Region 3 (http://www.fs.fed.us/r3/)

- S Sensitive: those taxa occurring on National Forests in Arizona which are considered sensitive by the Regional Forester.

BLM **US Bureau of Land Management** (2000 Animals, 2000 Plants)
US Department of Interior, Bureau of Land Management, Arizona State Office (http://azwww.az.blm.gov)

- S Sensitive: those taxa occurring on BLM Field Office Lands in Arizona which are considered sensitive by the Arizona State Office.
- P Population: only those populations of Banded Gila monster (*Heloderma suspectum cinctum*) that occur north and west of the Colorado River, are considered sensitive by the Arizona State Office.

TRIBAL STATUS

NESL **Navajo Endangered Species List** (1997)
Navajo Nation, Navajo Fish and Wildlife Department
(http://www.heritage.tnc.org/nhp/us/navajo/esl.html)

The Navajo Endangered Species List contains taxa with status from the entire Navajo Nation which includes parts of Arizona, Utah, and New Mexico. In this notebook we provide NESL status for only those taxa whose distribution includes part or all of the Arizona portion of the Navajo Nation.

Groups

1 Those species or subspecies that no longer occur on the Navajo Nation.

2 Any species or subspecies which is in danger of being eliminated from all or a significant portion of its range on the Navajo Nation.

3 Any species or subspecies which is likely to become an endangered species, within the foreseeable future, throughout all or a significant portion of its range on the Navajo Nation.

4 Any species or subspecies for which the Navajo Fish and Wildlife Department (NF&WD) does not currently have sufficient information to support their being listed in Group 2 or Group 3 but has reason to consider them. The NF&WD will actively seek information on these species to determine if they warrant inclusion in a different group or removal from the list.

MEXICAN STATUS

MEX **Mexican Federal Endangered Species List** (May 16, 1994)
Secretaría de Desarollo Social, NORMA Oficial Mexicana NOM-059-ECOL-1994

The Mexican Federal Endangered Species List contains taxa with status from the entire Mexican Republic and waters under its jurisdiction. In this notebook we provide MEX designations for only those taxa occurring in Arizona and also in Mexico.

P En Peligro de Extinción(Determined Endangered in Mexico): in danger of extinction.

A Amenazada (Determined Threatened in Mexico): could become endangered if factors causing habitat deterioration or population decline continue.

R Rara (Determined Rare in Mexico): populations viable but naturally scarce or restricted to an area of reduced distribution or very specific habitats.

Pr Sujeta a ProtecciónEspecial (Determined Subject to Special Protection in Mexico): utilization limited due to reduced populations, restricted distribution, or to favor recovery and conservation of the taxon or associated taxa.

[| = One or more subspecies of this species has status in Mexico, but the HDMS does not track it at the subspecies level (most of these subspecies are endemic to Mexico). Please consult the NORMA Oficial Mexicana NOM-059-ECOL-1994 for details.]

STATE STATUS

NPL **Arizona Native Plant Law** (1993)
Arizona Department of Agriculture (http://agriculture.state.az.us/PSD/nativeplants.htm)

- HS Highly Safeguarded: no collection allowed.
- SR Salvage Restricted: collection only with permit.
- ER Export Restricted: transport out of State prohibited.
- SA Salvage Assessed: permits required to remove live trees.
- HR Harvest Restricted: permits required to remove plant by-products.

WSCA **Wildlife of Special Concern in Arizona** (1996 in prep)
Arizona Game and Fish Department (http://www.azgfd.com)

- WC Wildlife of Special Concern in Arizona. Species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Arizona Game and Fish Department's listing of Wildlife of Special Concern in Arizona (WSCA, in prep). Species indicated on printouts as WC are currently the same as those in **Threatened Native Wildlife in Arizona** (1988).

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
2221 WEST GREENWAY ROAD, PHOENIX, AZ 85023-4399
(602) 942-3000 • WWW.AZGFD.COM
Yuma Office, 9140 E 28th Street, Yuma, AZ 85365-3596 (520) 342-0091

MAY 14 2001
RECEIVED

GOVERNOR
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COMMISSIONERS
CHAIRMAN, DENNIS D. MANNING, ALPINE
MICHAEL M. GOLIGHTLY, FLAGSTAFF
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SUSAN E. CHILTON, ARIVACA
W. HAYS GILSTRAP, PHOENIX
DIRECTOR
DUANE L. SHROUFE
DEPUTY DIRECTOR
STEVE K. FERRELL

May 11, 2001

Jennifer Baker
Environmental Planner
URS
7720 North 16th Street
Phoenix, Arizona 85020

Re: Biological Information for Allegheny Energy Supply Company Natural Gas-fired Generating Facility, Gas and Water Pipelines and Transmission Lines, La Paz County

Dear Ms. Baker:

The Arizona Game and Fish Department (Department) has reviewed your letter dated April 10, 2001 requesting special status species and biological information on the above-referenced electrical generating facility, gas and water pipelines and transmission lines located in Township 2 North, Range 113 West, Sections 1 – 6, 11 – 14 and 23 - 25. The following comments are provided for your consideration.

The Department's Heritage Data Management System (HDMS) has been accessed and the results reported in a letter dated April 18, 2001 (enclosed). The Sonoran desert tortoise has been documented in the vicinity of the proposed project area. A copy of the Department's guidelines for handling Sonoran desert tortoises is enclosed for your reference. This information should be considered during the planning, design and implementation processes associated with this project. If any desert tortoises are encountered during the project, we request that these guidelines be followed.

The Department notes that the facility may use evaporation ponds for discharged cooling waters; however, specific details regarding the use of these ponds have not been given. The Department is concerned about potential direct impacts to wildlife related to these ponds. Ponds will attract wildlife and low quality water in these ponds could have adverse impacts on wildlife, especially waterfowl. The Department is willing to work with Allegheny Energy Supply Company or their consultants to minimize potential adverse impacts from these ponds and possibly enhance the area for wildlife.

The Department notes that Centennial Wash flows through the southwest corner of the property. Department personnel, during a site visit on May 4, 2001, observed that the wash is broad and

shallow, with a poorly defined channel. For that reason, we recommend contacting the U.S. Army Corps of Engineers, at the address provided below, for a Clean Water Act jurisdictional determination and related permits which may be required for the generating plant, pipelines and distribution lines.

Marjorie Blaine
U.S. Army Corps of Engineers
Regulatory Branch
5205 E. Comanche Street
Davis Monthan AFB, Arizona 85707
520-584-4486

Thank you for the opportunity to review and comment on this proposed project. Please notify me of any meetings or other activities associated with the siting and environmental compliance process. If you have any questions, please contact me at 520-342-0091.

Sincerely,

William C Knowles

William C. Knowles
Habitat Specialist
Region IV, Yuma

cc: Russell Engel, Habitat Program Manager, Region IV
Larry Voyles, Regional Supervisor, Region IV
Bob Broscheid, Proj. Eval. Prog. Supervisor, Habitat Branch
Marjorie Blaine, U.S. Army Corps of Engineers, Regulatory Branch

AGFD # 04-13-01 (11)

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
2221 WEST GREENWAY ROAD, PHOENIX, AZ 85023-4399
(602) 942-3000 • WWW.AZGFD.COM

GOVERNOR
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SUSAN E. CHILTON, ARIVACA
W. HAYS GILSTRAP, PHOENIX
DIRECTOR
DUANE L. SHROUFE
DEPUTY DIRECTOR
STEVE K. FERRELL

April 18, 2001

Ms. Jennifer Baker
URS
7720 North 16th St.
Suite 100
Phoenix, AZ 85020

Re: Special Status Species Information for **Township 2 North, Range 11 West, Sections 1-6, 11-14, 23-25; Allegheny Energy Supply Company Natural Gas-fired Generating Facility and Pipelines.**

Dear Ms. Baker:

The Arizona Game and Fish Department (Department) has reviewed your letter, dated April 10, 2001, regarding special status species information associated with the above-referenced project area. The Department's Heritage Data Management System (HDMS) has been accessed and current records show that the special status species listed on the attachment have been documented as occurring in the project area. In addition, this project does not occur in the vicinity of any proposed or designated Critical Habitats.

The Department's HDMS data are not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity.

Making available this information does not substitute for the Department's review of project proposals, and should not decrease our opportunities to review and evaluate new project proposals and sites. The Department is also concerned about other resource values, such as other wildlife, including game species, and wildlife-related recreation. The Department would appreciate the opportunity to provide an evaluation of impacts to wildlife or wildlife habitats associated with project activities occurring in the subject area, when specific details become available.

If you have any questions regarding the attached species list, please contact me at (602) 789-3618. General status information and county distribution lists for special status species are also available on our web site at http://www.azgfd.com/frames/fishwild/hdms_site/Home.htm.

Sincerely,

Sabra S. Schwartz
Heritage Data Management System, Coordinator

SSS:ss

Attachment

cc: Bob Broscheid, Project Evaluation Program Supervisor
Russ Engel, Habitat Program Manager, Region IV

AGFD #04-13-01 (11)

Special Status Species within 5 miles of T2N,R11W Sec 1-6, 11-14, 23-25

Arizona Game and Fish Department, Heritage Data Management System

April 18, 2001

Scientific Name	Common Name	ESA	USFS	BLM	WSCA	NPL
GOPHERUS AGASSIZII (SONORAN POPULATION)	SONORAN DESERT TORTOISE	SC			WC	

No Critical Habitats in project area; AGFD #04-13-01 (11), Allegheny Energy Supply Company Natural Gas-fired Generating Facility and Pipelines.

GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES ENCOUNTERED ON DEVELOPMENT PROJECTS

Arizona Game and Fish Department
Revised January 17, 1997

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

Desert tortoises of the Sonoran population are those occurring south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position at all times and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 105 degrees fahrenheit unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to two miles, but no further than necessary from its original location. If a release site, or alternate burrow, is unavailable within this distance, and ambient air temperature exceeds 105 degrees fahrenheit, the Department should be contacted to place the tortoise into a Department-regulated desert tortoise adoption program. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, will also be placed in desert tortoise adoption programs. *Managers of projects likely to affect desert tortoises should obtain a scientific collecting permit from the Department to facilitate temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

- These guidelines do not apply to the Mohave population of desert tortoises (north and west of the Colorado River). Mohave desert tortoises are specifically protected under the Endangered Species Act, as administered by the U.S. Fish and Wildlife Service.

- These guidelines are subject to revision at the discretion of the Department. We recommend that the Department be contacted during the planning stages of any project that may affect desert tortoises.

- Take, possession, or harassment of wild desert tortoises is prohibited by state law. Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.

RAC:NLO:rc

URS

June 1, 2001

John Kennedy
Project Evaluation Program Supervisor, Habitat Branch
Arizona Game and Fish Department
2221 West Greenway Road
Phoenix, AZ 85023-4399

Dear Mr. Kennedy:
This letter updates the information presented in our letter dated April 10, 2001. Allegheny Energy Supply, L.L.C. (Allegheny) has moved the proposed generating facility site from the SW ¼, Sec 1, T2N, R11W to the S ½, Sec 35, T3N, R11W. The new site is less than one mile northwest of the initially identified site. The new site was selected in an effort to avoid locating the plant within the 100-year floodplain.

The generating facility site (S 1/2, SEC 35, T3N, R11W) is located approximately 0.75 mile south of Exit 69 along Interstate 10, approximately 75 miles west of downtown Phoenix, Arizona. A map of the project site and surrounding area is attached. The generating facility is located on somewhat disturbed desert scrub landscape along the north side of Centennial Wash. The surrounding project area consists of a combination of undisturbed desert scrub and agricultural areas. The surrounding areas include distant mountains and desert areas, as described in our previous correspondence.

We have received information from Sabra Schwartz on special status species recorded in the area, as well as comments from William Knowles. If there are additional special status species data that Allegheny should be aware of, due to the changed project location, please contact me with that information. I have attached a revised map for reference. If you have any questions or problems with my request, I can be reached at (602) 371-1100, or via e-mail at jennifer_baker@urscorp.com. Thank you for your assistance.

Sincerely,

Jennifer Baker
Environmental Planner

attachment

URS Corporation
7720 North 16th Street, Suite 100
Phoenix, AZ 85020
Tel: 602.371.1100
Fax: 602.371.1615

ATTACHMENT C-2—U.S. FISH AND WILDLIFE SERVICE LETTER

file

URS

7720 North 16th Street
Suite 100
Phoenix, Arizona 85020
602 371 1100 Tel
602 371 1615 Fax

April 10, 2001

Jackie Hanson
United States Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4915

Dear Ms. Hanson:

Allegheny Energy Supply Company, L.L.C. (Allegheny) is planning to construct a 1,080-megawatt (MW) natural gas-fired generating facility in La Paz County, Arizona. The generating facility would be a "merchant plant," which means it would operate without long-term power contracts for the purpose of selling power on the wholesale electric market. The generating facility would be located on private undeveloped land and would interconnect with the regional grid via a 500-kilovolt (kV) transmission line tying the existing Palo Verde-Devers 500kV transmission line approximately 2 to 3 miles north of the generating facility site. Additional facilities needed to operate the plant include one natural gas pipeline lateral, one water pipeline for transporting cooling water to a discharge area, and possibly evaporation ponds where cooling water would be discharged (though alternatives that do not require evaporation ponds, e.g., groundwater recharge, are being considered). The gas pipeline lateral would interconnect with the existing El Paso Natural Gas pipeline corridor approximately 3 to 4 miles south of the generating facility site. The cooling water pipeline would transport water that had cycled through the plant to an existing recharge well or evaporation ponds that would be located approximately 0.5 to 1 mile northwest of the plant site.

The generating facility site (SW 1/4, SEC 1, T2N, R11W) is located approximately 1.5 miles south of Exit 69 along Interstate 10, approximately 75 miles west of downtown Phoenix, Arizona. A map of the project site and surrounding area is attached. The generating facility is located on relatively undisturbed desert scrub landscape along the north side of Centennial Wash. The surrounding project area consists of a combination of undisturbed desert scrub and agricultural areas, as well as a dense mesquite bosque associated with Centennial Wash. There are several distant mountain ranges surrounding the project area including the Little Harquahala Mountains

approximately 12 miles to the northwest, Big Horn Mountains approximately 10 miles to the northeast, and the Eagletail Mountains approximately 5 miles to the southwest. The Eagletail Mountain Wilderness boundary encopasses the mountains as well as several miles of desert to the south of the project area.

We will review the information and threatened and endangered species (listed and proposed for listing) within La Paz County that is available on your internet website (http://ifw2es.fws.gov/EndangeredSpecies/lists/). If you believe there are sensitive species or habitats within the project vicinity in addition to those available via the internet, please contact me with that information. In addition, if there is a representative of USFWS that should be notified regarding the siting process and any upcoming public meetings, please contact me with that information. If you have any questions or comments on the project, I can be reached at (602) 371-1100, or via e-mail at jennifer_baker@urscorp.com.

Sincerely,

Jennifer Baker
Environmental Planner

attachment

cc: Stephanie Barrett

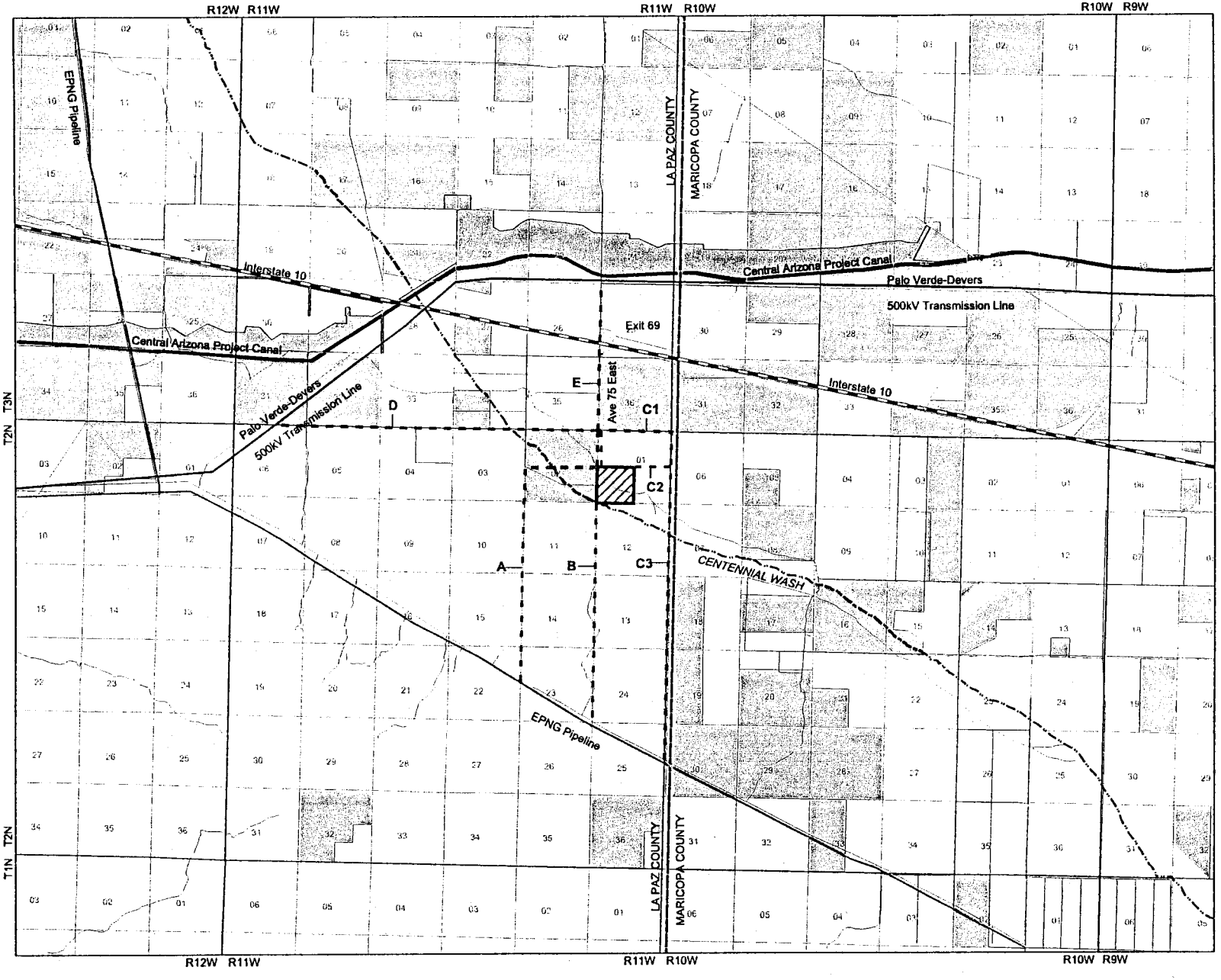

Exhibit A-2
Ownership and Jurisdiction Map

La Paz Generating Facility
Allegheny Energy
Supply Company, LLC

Legend

- Bureau of Land Management
- State Trust Lands
- Private Lands
- Bureau of Reclamation
- Central Arizona Project Canal
- Generation Facility Site
- Township and Range Lines
- Section Lines
- County Boundary
- Major Roads
- Minor Roads
- Centennial Wash
- Gas Pipeline Lateral Alternatives
- EPNG Pipeline
- 500kV Transmission Line Alternatives
- Palo Verde-Devers 500kV Transmission Line

Note:
Only one gas pipeline alternative and one transmission line alternative will be constructed.

Source:
Ownership: Arizona State Land Dept., 1996.

Working Draft 03/28/01

N
W E
S

Scale In Miles
0 0.5 1 1.5 2

URS

URS

June 1, 2001

Jackie Hanson
United States Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4915

Dear Ms. Hanson:
This letter updates the information presented in our letter dated April 10, 2001. Allegheny Energy Supply, L.L.C. (Allegheny) has moved the proposed generating facility site from the SW ¼, Sec 1, T2N, R11W to the S ½, Sec 35, T3N, R11W. The new site is less than one mile northwest of the initially identified site. The new site was selected in an effort to avoid locating the plant within the 100-year floodplain.

The generating facility site (S 1/2, SEC 35, T3N, R11W) is located approximately 0.75 mile south of Exit 69 along Interstate 10, approximately 75 miles west of downtown Phoenix, Arizona. A map of the project site and surrounding area is attached. The generating facility is located on somewhat disturbed desert scrub landscape along the north side of Centennial Wash. The surrounding project area consists of a combination of undisturbed desert scrub and agricultural areas. The surrounding areas include distant mountains and desert areas, as described in our previous correspondence.

We have reviewed the information and threatened and endangered species (listed and proposed for listing) within La Paz County that is available on your internet website (http://ifw2es.fws.gov/EndangeredSpecies/lists/) and have initiated field surveys of the area. If you believe there are sensitive species or habitats within the project vicinity in addition to those available via the internet, please contact me with that information. In addition, if there is a representative of USFWS that should be notified regarding the siting process and any upcoming public meetings, please contact me with that information. If you have any questions or comments on the project, I can be reached at (602) 371-1100, or via e-mail at jennifer_baker@urscorp.com.

Sincerely,

Jennifer Baker

Jennifer Baker
Environmental Planner

attachment

cc: Stefanie Barrett

URS Corporation
7720 North 16th Street, Suite 100
Phoenix, AZ 85020
Tel: 602.371.1100
Fax: 602.371.1615

United States Department of the Interior

U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 FAX: (602) 242-2513

In Reply Refer To:

AESO/SE
2-21-01-I-345

June 15, 2001

JUN 19 2001
RECEIVED

Ms. Jennifer Baker
Environmental Planner
URS Corporation
7720 North 16th Street, Suite 100
Phoenix, Arizona 85020

RE: Allegheny Energy Supply's Proposed Generating Facility Site at Exit 69 along I-10

Dear Ms. Baker:

This letter responds to your June 15, 2001, request for an inventory of threatened or endangered species, or those that are proposed to be listed as such under the Endangered Species Act of 1973, as amended (Act), which may potentially occur in your project area (La Paz and Maricopa Counties). The enclosed list may include candidate species as well. We hope the enclosed county list of species will be helpful. In future communications regarding this project, please refer to consultation number 2-21-01-I-345.

The enclosed list of the endangered, threatened, proposed, and candidate species includes all those potentially occurring anywhere in the county, or counties, where your project occurs. Please note that your project area may not necessarily include all or any of these species. The information provided includes general descriptions, habitat requirements, and other information for each species on the list. Also on the enclosed list is the Code of Federal Regulations (CFR) citation for each list and is available at most public libraries. This information should assist you in determining which species may or may not occur within your project area. Site-specific surveys could also be helpful and may be needed to verify the presence or absence of a species or its habitat as required for the evaluation of proposed project-related impacts.

Endangered and threatened species are protected by Federal law and must be considered prior to project development. If the action agency determines that listed species or critical habitat may be adversely affected by a federally funded, permitted, or authorized activity, the action agency must request formal consultation with the Service. If the action agency determines that the planned action may jeopardize a proposed species or destroy or adversely modify proposed critical habitat, the action agency must enter into a section 7 conference with the Service. Candidate species are those which are being considered for addition to the list of threatened or endangered species. Candidate species are those for which there is sufficient information to support a

proposal for listing. Although candidate species have no legal protection under the Act, we recommend that they be considered in the planning process in the event that they become listed or proposed for listing prior to project completion.

If any proposed action occurs in or near areas with trees and shrubs growing along watercourses, known as riparian habitat, the Service recommends the protection of these areas. Riparian areas are critical to biological community diversity and provide linear corridors important to migratory species. In addition, if the project will result in the deposition of dredged or fill materials into waterways or excavation in waterways, we recommend you contact the Army Corps of Engineers which regulates these activities under Section 404 of the Clean Water Act.

The State of Arizona protects some plant and animal species not protected by Federal law. We recommend you contact the Arizona Game and Fish Department and the Arizona Department of Agriculture for State-listed or sensitive species in your project area.

The Service appreciates your efforts to identify and avoid impacts to listed and sensitive species in your project area. If we may be of further assistance, please feel free to contact Tom Gatz (x240).

Sincerely,

Jacqueline Harlow

for David L. Harlow
Field Supervisor

Enclosures

cc: John Kennedy, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

LISTED, PROPOSED, AND CANDIDATE SPECIES FOR THE FOLLOWING COUNTY: LA PAZ

02/26/2001

1) LISTED TOTAL= 8

NAME: **BONYTAIL CHUB** *GILA ELEGANS*

STATUS: ENDANGERED CRITICAL HAB Yes RECOVERY PLAN: Yes CFR: 45 FR 27710, 04-23-1980; 59 FR 13374, 03-21-1994

DESCRIPTION: LARGE (12-14 UP TO 24 INCHES) MINNOW CHARACTERIZED BY SMALL HEAD LARGE FINS SLIGHTLY HUMPED BACK AND LONG THIN CAUDAL PEDUNCLE.

ELEVATION RANGE: <4000 FT.

COUNTIES: MOHAVE, LA PAZ

HABITAT: WARM SWIFT TURBID MAINSTEM RIVERS OF THE COLORADO RIVER BASIN, RESERVOIRS IN LOWER BASIN

ENDEMIC TO COLORADO RIVER BASIN. RAREST OF COLORADO RIVER FISH. POPULATION AUGMENTATION IS ONGOING IN LAKE MOHAVE AND LAKE HAVASU.

NAME: **DESERT PUPFISH** *CYPRINODON MACULARIUS*

STATUS: ENDANGERED CRITICAL HAB Yes RECOVERY PLAN: Yes CFR: 51 FR 10842, 03-31-1986

DESCRIPTION: SMALL (2 INCHES) SMOOTHLY ROUNDED BODY SHAPE WITH NARROW VERTICAL BARS ON THE SIDES. BREEDING MALES BLUE ON HEAD AND SIDES WITH YELLOW ON TAIL. FEMALES & JUVENILES TAN TO OLIVE COLORED BACK AND SILVERY SIDES.

ELEVATION RANGE: <5000 FT.

COUNTIES: LA PAZ, PIMA, GRAHAM, MARICOPA, PINAL, YAVAPAI, SANTA CRUZ

HABITAT: SHALLOW SPRINGS, SMALL STREAMS, AND MARSHES. TOLERATES SALINE & WARM WATER

CRITICAL HABITAT INCLUDES QUITOBAQUITO SPRING, PIMA COUNTY, PORTIONS OF SAN FELIPE CREEK, CARRIZO WASH, AND FISH CREEK WASH, IMPERIAL COUNTY, CALIFORNIA. TWO SUBSPECIES ARE RECOGNIZED: DESERT PUPFISH (C. m. macularis) AND QUITOBAQUITO PUPFISH (C. m. eremus).

NAME: **GILA TOPMINNOW** *POECILIOPSIS OCCIDENTALIS OCCIDENTALIS*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 32 FR 4001, 03-11-1967

DESCRIPTION: SMALL (2 INCHES), GUPPY-LIKE, LIVE BEARING, LACKS DARK SPOTS ON ITS FINS. BREEDING MALES ARE JET BLACK WITH YELLOW FINS.

ELEVATION RANGE: <4500 FT.

COUNTIES: GILA, PINAL, GRAHAM, YAVAPAI, SANTA CRUZ, PIMA, MARICOPA, LA PAZ

HABITAT: SMALL STREAMS, SPRINGS, AND CIENEGAS VEGETATED SHALLOWS

SPECIES HISTORICALLY OCCURRED IN BACKWATERS OF LARGE RIVERS BUT IS CURRENTLY ISOLATED TO SMALL STREAMS AND SPRINGS

NAME: RAZORBACK SUCKER *XYRAUCHEN TEXANUS*

STATUS: ENDANGERED CRITICAL HAB Yes RECOVERY PLAN: Yes CFR: 55 FR 21154, 05-22-1990; 59 FR 13374, 03-21-1994

DESCRIPTION: LARGE (UP TO 3 FEET AND UP TO 16 POUNDS) LONG, HIGH SHARP-EDGED KEEL-LIKE HUMP BEHIND THE HEAD. HEAD FLATTENED ON TOP. OLIVE-BROWN ABOVE TO YELLOWISH BELOW.

ELEVATION RANGE: <6000 FT.

COUNTIES: GREENLEE, MOHAVE, PINAL, YAVAPAI, YUMA, LA PAZ, MARICOPA (REFUGIA), GILA, COCONINO, GRAHAM

HABITAT: RIVERINE & LACUSTRINE AREAS, GENERALLY NOT IN FAST MOVING WATER AND MAY USE BACKWATERS

SPECIES IS ALSO FOUND IN HORSESHOE RESERVOIR (MARICOPA COUNTY).CRITICAL HABITAT INCLUDES THE 100-YEAR FLOODPLAIN OF THE RIVER THROUGH GRAND CANYON FROM CONFLUENCE WITH PARIA RIVER TO HOOVER DAM; HOOVER DAM TO DAVIS DAM; PARKER DAM TO IMPERIAL DAM. ALSO GILA RIVER FROM AZ/NM BORDER TO COOLIDGE DAM; AND SALT RIVER FROM HWY 60/SR 77 BRIDGE TO ROOSEVELT DAM; VERDE RIVER FROM FS BOUNDARY TO HORSESHOE LAKE.

NAME: BALD EAGLE *HALIAEETUS LEUCOCEPHALUS*

STATUS: THREATENED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 60 FR 35999, 07-12-95

DESCRIPTION: LARGE. ADULTS HAVE WHITE HEAD AND TAIL. HEIGHT 28 - 38"; WINGSPAN 66 - 96". 1-4 YRS DARK WITH VARYING DEGREES OF MOTTLED BROWN PLUMAGE. FEET BARE OF FEATHERS.

ELEVATION RANGE: VARIES FT.

COUNTIES: YUMA, LA PAZ, MOHAVE, YAVAPAI, MARICOPA, PINAL, COCONINO, NAVAJO, APACHE, SANTA CRUZ, PIMA, GILA, GRAHAM, COCHISE

HABITAT: LARGE TREES OR CLIFFS NEAR WATER (RESERVOIRS, RIVERS AND STREAMS) WITH ABUNDANT PREY

SOME BIRDS ARE NESTING RESIDENTS WHILE A LARGER NUMBER WINTERS ALONG RIVERS AND RESERVOIRS. AN ESTIMATED 200 TO 300 BIRDS WINTER IN ARIZONA. ONCE ENDANGERED (32 FR 4001, 03-11-1967; 43 FR 6233, 02-14-78) BECAUSE OF REPRODUCTIVE FAILURES FROM PESTICIDE POISONING AND LOSS OF HABITAT, THIS SPECIES WAS DOWN LISTED TO THREATENED ON AUGUST 11, 1995. ILLEGAL SHOOTING, DISTURBANCE, LOSS OF HABITAT CONTINUES TO BE A PROBLEM. SPECIES HAS BEEN PROPOSED FOR DELISTING (64 FR 36454) BUT STILL RECEIVES FULL PROTECTION UNDER ESA.

NAME: BROWN PELICAN *PELECANUS OCCIDENTALIS*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 35 FR 16047, 10-13-70; 35 FR 18320, 12-02-70

DESCRIPTION: LARGE DARK GRAY-BROWN WATER BIRD WITH A POUCH UNDERNEATH LONG BILL AND WEBBED FEET. ADULTS HAVE A WHITE HEAD AND NECK, BROWNISH BLACK BREAST, AND SILVER GRAY UPPER PARTS.

ELEVATION RANGE: VARIES FT.

COUNTIES: LA PAZ YUMA

HABITAT: COASTAL LAND AND ISLANDS

SUBSPECIES IS FOUND ON PACIFIC COAST AND IS ENDANGERED DUE TO PESTICIDES. IT IS AN UNCOMMON TRANSIENT IN ARIZONA ON LOWER COLORADO RIVER. INDIVIDUALS WANDER UP FROM MEXICO IN SUMMER AND FALL. NO BREEDING RECORDS IN ARIZONA.

NAME: SOUTHWESTERN WILLOW FLYCATCHER *EMPIDONAX TRAILLII EXTIMUS*

STATUS: ENDANGERED CRITICAL HAB Yes RECOVERY PLAN: No CFR: 60 FR 10694, 02-27-95

DESCRIPTION: SMALL PASSERINE (ABOUT 6") GRAYISH-GREEN BACK AND WINGS, WHITISH THROAT, LIGHT OLIVE-GRAY BREAST AND PALE YELLOWISH BELLY. TWO WINGBARS VISIBLE. EYE-RING FAINT OR ABSENT. ELEVATION RANGE: <8500 FT.

COUNTIES: YAVAPAI, GILA, MARICOPA, MOHAVE, COCONINO, NAVAJO, APACHE, PINAL, LA PAZ, GREENLEE, GRAHAM, YUMA, PIMA, COCHISE, SANTA CRUZ

HABITAT: COTTONWOOD/WILLOW & TAMARISK VEGETATION COMMUNITIES ALONG RIVERS & STREAMS

MIGRATORY RIPARIAN OBLIGATE SPECIES THAT OCCUPIES BREEDING HABITAT FROM LATE APRIL TO SEPTEMBER. DISTRIBUTION WITHIN ITS RANGE IS RESTRICTED TO RIPARIAN CORRIDORS. DIFFICULT TO DISTINGUISH FROM OTHER MEMBERS OF THE EMPIDONAX COMPLEX BY SIGHT ALONE. TRAINING SEMINAR REQUIRED FOR THOSE CONDUCTING FLYCATCHER SURVEYS. CRITICAL HABITAT ON PORTIONS OF THE 100-YEAR FLOODPLAIN ON SAN PEDRO AND VERDE RIVERS; WET BEAVER AND WEST CLEAR CREEKS, INCLUDING TAVASCI MARSH AND ISTER FLAT; THE COLORADO RIVER, THE LITTLE COLORADO RIVER, AND THE WEST, EAST, AND SOUTH FORKS OF THE LITTLE COLORADO RIVER, REFERENCE 60 CFR:62 FR 39129, 7/22/97.

NAME: YUMA CLAPPER RAIL *RALLUS LONGIROSTRIS YUMANENSIS*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 32 FR 4001, 03-11-67; 48 FR 34182, 07-27-83

DESCRIPTION: WATER BIRD WITH LONG LEGS AND SHORT TAIL. LONG SLENDER DECURVED BILL. MOTTLED BROWN ON GRAY ON ITS RUMP. FLANKS AND UNDERSIDES ARE DARK GRAY WITH NARROW VERTICAL STRIPES PRODUCING A BARRING EFFECT. ELEVATION RANGE: <4500 FT.

COUNTIES: YUMA, LA PAZ, MARICOPA, PINAL, MOHAVE

HABITAT: FRESH WATER AND BRACKISH MARSHES

SPECIES IS ASSOCIATED WITH DENSE EMERGENT RIPARIAN VEGETATION. REQUIRES WET SUBSTRATE (MUDFLAT, SANDBAR) WITH DENSE HERBACEOUS OR WOODY VEGETATION FOR NESTING AND FORAGING. CHANNELIZATION AND MARSH DEVELOPMENT ARE PRIMARY SOURCES OF HABITAT LOSS.

LISTED, PROPOSED, AND CANDIDATE SPECIES FOR THE FOLLOWING COUNTY: MARICOPA

02/26/2001

1) LISTED

TOTAL= 13

NAME: ARIZONA AGAVE *AGAVE ARIZONICA*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: No CFR: 49 FR 21055, 05-18-1984

DESCRIPTION: HAS ATTRACTIVE ROSETTES OF BRIGHT GREEN LEAVES WITH DARK MAHOGANY MARGINS. FLOWER: BORNE ON SUB-UMBELLATE INFLORESCENCES.

ELEVATION RANGE: 3000-6000 FT.

COUNTIES: GILA, YAVAPAI, MARICOPA

HABITAT: TRANSITION ZONE BETWEEN OAK-JUNIPER WOODLAND & MOUNTAIN MAHOGANY-OAK SCRUB

SCATTERED CLONES IN NEW RIVER MOUNTAINS AND SIERRA ANCHA. USUALLY FOUND ON STEEP, ROCKY SLOPES. POSSIBLY MAZATAL MOUNTAINS. SHOULD BE LOOKED FOR WHEREVER THE RANGES OF Agave toumeyana var. bella AND Agave chrystantha OVERLAP.

NAME: ARIZONA CLIFFROSE *PURSHIA SUBINTEGRA*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 49 FR 22326 5-29-84

DESCRIPTION: EVERGREEN SHRUB OF THE ROSE FAMILY (ROSEACEAE). BARK PALE SHREDDY. YOUNG TWIGS WITH DENSE HAIRS. LEAVES 1-5 LOBES AND EDGES CURL DOWNWARD (REVOLUTE). FLOWERS: 5 WHITE OR YELLOW PETALS <0.5 INCH LONG.

ELEVATION RANGE: <4000 FT.

COUNTIES: GRAHAM YAVAPAI MARICOPA MOHAVE

HABITAT: CHARACTERISTIC WHITE SOILS OF TERTIARY LIMESTONE LAKEBED DEPOSITS.

WHITE SOILS OF TERITIARY LIMESTONE LAKEBED DEPOSITS CAN BE SEEN FROM A DISTANCE.

NAME: ARIZONA HEDGEHOG CACTUS *ECHINOCEREUS TRIGLOCHIDIATUS ARIZONICUS*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: No CFR: 44 FR 61556,10-15-1979

DESCRIPTION: DARK GREEN CYLINDROID 2.5-12 INCHES TALL, 2-10 INCHES IN DIAMETER, SINGLE OR IN CLUSTERS. 1-3 GRAY OR PINKISH CENTRAL SPINES LARGEST DEFLEXED AND 5-11 SHORTER RADIAL SPINES. FLOWER: BRILLIANT RED, SIDE OF STEM IN APRIL- MAY

ELEVATION RANGE: 3700-5200 FT.

COUNTIES: MARICOPA, GILA, PINAL

HABITAT: ECOTONE BETWEEN INTERIOR CHAPPARAL AND MADREAN EVERGREEN WOODLAND

OPEN SLOPES, IN NARROW CRACKS BETWEEN BOULDERS, AND IN UNDERSTORY OF SHRUBS. THIS VARIETY IS BELIEVED TO INTERGRADE AT THE EDGES OF ITS DISTRIBUTION WITH VARIETIES MELANCANTHUS AND NEOMEXICANUS CAUSING SOME CONFUSION IN IDENTIFICATION.

NAME: LESSER LONG-NOSED BAT *LEPTONYCTERIS CURASOAE YERBABUENAE*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 53 FR 38456, 09-30-88
DESCRIPTION: ELONGATED MUZZLE, SMALL LEAF NOSE, AND LONG TONGUE. YELLOWISH BROWN OR GRAY ABOVE AND CINNAMON BROWN BELOW. TAIL MINUTE AND APPEARS TO BE LACKING. EASILY DISTURBED.
ELEVATION RANGE: <6000 FT.

COUNTIES: COCHISE, PIMA, SANTA CRUZ, GRAHAM, PINAL, MARICOPA

HABITAT: DESERT SCRUB HABITAT WITH AGAVE AND COLUNMNAR CACTI PRESENT AS FOOD PLANTS

DAY ROOSTS IN CAVES AND ABANDONED TUNNELS. FORAGES AT NIGHT ON NECTAR, POLLEN, AND FRUIT OF PANICULATE AGAVES AND COLUMNAR CACTI. THIS SPECIES IS MIGRATORY AND IS PRESENT IN ARIZONA , USUALLY FROM APRIL TO SEPTMBER AND SOUTH OF THE BORDER THE REMAINDER OF THE YEAR.

NAME: SONORAN PRONGHORN *ANTILOCAPRA AMERICANA SONORIENSIS*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 32 FR 4001, 03-11-67
DESCRIPTION: BUFF ON BACK AND WHITE BELOW, HOOFED WITH SLIGHTLY CURVED BLACK HORNS HAVING A SINGLE PRONG. SMALLEST AND PALEST OF THE PRONGHORN SUBSPECIES.
ELEVATION RANGE: 2000-4000 FT.

COUNTIES: PIMA, YUMA, MARICOPA

HABITAT: BROAD, INTERMOUNTAIN ALLUVIAL VALLEYS WITH CREOSOTE-BURSAGE & PALO VERDE-MIXED CACTI ASSOCIATIONS

TYPICALLY, BAJADAS ARE USED AS FAWNING AREAS AND SANDY DUNE AREAS PROVIDE FOOD SEASONALLY. HISTORIC RANGE WAS PROBABLY LARGER THAN EXISTS TODAY. THIS SUBSPECIES ALSO OCCURS IN MEXICO.

NAME: DESERT PUPFISH *CYPRINODON MACULARIUS*

STATUS: ENDANGERED CRITICAL HAB Yes RECOVERY PLAN: Yes CFR: 51 FR 10842, 03-31-1986
DESCRIPTION: SMALL (2 INCHES) SMOOTHLY ROUNDED BODY SHAPE WITH NARROW VERTICAL BARS ON THE SIDES. BREEDING MALES BLUE ON HEAD AND SIDES WITH YELLOW ON TAIL. FEMALES & JUVENILES TAN TO OLIVE COLORED BACK AND SILVERY SIDES.
ELEVATION RANGE: <5000 FT.

COUNTIES: LA PAZ, PIMA, GRAHAM, MARICOPA, PINAL, YAVAPAI, SANTA CRUZ

HABITAT: SHALLOW SPRINGS, SMALL STREAMS, AND MARSHES. TOLERATES SALINE & WARM WATER

CRITICAL HABITAT INCLUDES QUITOBAQUITO SPRING, PIMA COUNTY, PORTIONS OF SAN FELIPE CREEK, CARRIZO WASH, AND FISH CREEK WASH, IMPERIAL COUNTY, CALIFORNIA. TWO SUBSPECIES ARE RECOGNIZED: DESERT PUPFISH (C. m. macularis) AND QUITOBAQUITO PUPFISH (C. m. eremus).

LISTED, PROPOSED, AND CANDIDATE SPECIES FOR THE FOLLOWING COUNTY: MARICOPA

02/26/2001

NAME: GILA TOPMINNOW *POECILIOPSIS OCCIDENTALIS OCCIDENTALIS*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 32 FR 4001, 03-11-1967

DESCRIPTION: SMALL (2 INCHES), GUPPY-LIKE, LIVE BEARING, LACKS DARK SPOTS ON ITS FINS. BREEDING MALES ARE JET BLACK WITH YELLOW FINS.

ELEVATION RANGE: <4500 FT.

COUNTIES: GILA, PINAL, GRAHAM, YAVAPAI, SANTA CRUZ, PIMA, MARICOPA, LA PAZ

HABITAT: SMALL STREAMS, SPRINGS, AND CIENEGAS VEGETATED SHALLOWS

SPECIES HISTORICALLY OCCURRED IN BACKWATERS OF LARGE RIVERS BUT IS CURRENTLY ISOLATED TO SMALL STREAMS AND SPRINGS

NAME: RAZORBACK SUCKER *XYRAUCHEN TEXANUS*

STATUS: ENDANGERED CRITICAL HAB Yes RECOVERY PLAN: Yes CFR: 55 FR 21154, 05-22-1990; 59 FR 13374, 03-21-1994

DESCRIPTION: LARGE (UP TO 3 FEET AND UP TO 16 POUNDS) LONG, HIGH SHARP-EDGED KEEL-LIKE HUMP BEHIND THE HEAD. HEAD FLATTENED ON TOP. OLIVE-BROWN ABOVE TO YELLOWISH BELOW.

ELEVATION RANGE: <6000 FT.

COUNTIES: GREENLEE, MOHAVE, PINAL, YAVAPAI, YUMA, LA PAZ, MARICOPA (REFUGIA), GILA, COCONINO, GRAHAM

HABITAT: RIVERINE & LACUSTRINE AREAS, GENERALLY NOT IN FAST MOVING WATER AND MAY USE BACKWATERS

SPECIES IS ALSO FOUND IN HORSESHOE RESERVOIR (MARICOPA COUNTY).CRITICAL HABITAT INCLUDES THE 100-YEAR FLOODPLAIN OF THE RIVER THROUGH GRAND CANYON FROM CONFLUENCE WITH PARIA RIVER TO HOOVER DAM; HOOVER DAM TO DAVIS DAM; PARKER DAM TO IMPERIAL DAM. ALSO GILA RIVER FROM AZ/NM BORDER TO COOLIDGE DAM; AND SALT RIVER FROM HWY 60/SR 77 BRIDGE TO ROOSEVELT DAM; VERDE RIVER FROM FS BOUNDARY TO HORSESHOE LAKE.

NAME: BALD EAGLE *HALIAEETUS LEUCOCEPHALUS*

STATUS: THREATENED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 60 FR 35999, 07-12-95

DESCRIPTION: LARGE, ADULTS HAVE WHITE HEAD AND TAIL. HEIGHT 28 - 38"; WINGSPAN 66 - 96". 1-4 YRS DARK WITH VARYING DEGREES OF MOTTLED BROWN PLUMAGE. FEET BARE OF FEATHERS.

ELEVATION RANGE: VARIES FT.

COUNTIES: YUMA, LA PAZ, MOHAVE, YAVAPAI, MARICOPA, PINAL, COCONINO, NAVAJO, APACHE, SANTA CRUZ, PIMA, GILA, GRAHAM, COCHISE

HABITAT: LARGE TREES OR CLIFFS NEAR WATER (RESERVOIRS, RIVERS AND STREAMS) WITH ABUNDANT PREY

SOME BIRDS ARE NESTING RESIDENTS WHILE A LARGER NUMBER WINTERS ALONG RIVERS AND RESERVOIRS. AN ESTIMATED 200 TO 300 BIRDS WINTER IN ARIZONA. ONCE ENDANGERED (32 FR 4001, 03-11-1967; 43 FR 6233, 02-14-78) BECAUSE OF REPRODUCTIVE FAILURES FROM PESTICIDE POISONING AND LOSS OF HABITAT, THIS SPECIES WAS DOWN LISTED TO THREATENED ON AUGUST 11, 1995. ILLEGAL SHOOTING, DISTURBANCE, LOSS OF HABITAT CONTINUES TO BE A PROBLEM. SPECIES HAS BEEN PROPOSED FOR DELISTING (64 FR 36454) BUT STILL RECEIVES FULL PROTECTION UNDER ESA.

NAME: CACTUS FERRUGINOUS PYGMY-OWL *GLAUCIDIUM BRASILIANUM CACTORUM*

STATUS: ENDANGERED CRITICAL HAB Yes RECOVERY PLAN: No CFR: 62 FR 10730, 3-10-97

DESCRIPTION: SMALL (APPROX. 7"), DIURNAL OWL REDDISH BROWN OVERALL WITH CREAM-COLORED BELLY STREAKED WITH REDDISH BROWN. SOME INDIVIDUALS ARE GRAYISH BROWN

ELEVATION RANGE: <4000 FT.

COUNTIES: MARICOPA, YUMA, SANTA CRUZ, GRAHAM, GREENLEE, PIMA, PINAL, GILA, COCHISE

HABITAT: MATURE COTTONWOOD/WILLOW, MESQUITE BOSQUES, AND SONORAN DESERTSCRUB

RANGE LIMIT IN ARIZONA IS FROM NEW RIVER (NORTH) TO GILA BOX (EAST) TO CABEZA PRIETA MOUNTAINS (WEST). ONLY A FEW DOCUMENTED SITES WHERE THIS SPECIES PERSISTS ARE KNOWN, ADDITIONAL SURVEYS ARE NEEDED. CRITICAL HABITAT IN PIMA, COCHISE, PINAL, AND MARICOPA COUNTIES (64 FR 37419).

NAME: MEXICAN SPOTTED OWL *STRIX OCCIDENTALIS LUCIDA*

STATUS: THREATENED CRITICAL HAB Yes RECOVERY PLAN: Yes CFR: 56 FR 14678, 04-11-91; 66 FR 8530, 2/1/01

DESCRIPTION: MEDIUM SIZED WITH DARK EYES AND NO EAR TUFTS. BROWNISH AND HEAVILY SPOTTED WITH WHITE OR BEIGE.

ELEVATION RANGE: 4100-9000 FT.

COUNTIES: MOHAVE, COCONINO, NAVAJO, APACHE, YAVAPAI, GRAHAM, GREENLEE, COCHISE, SANTA CRUZ, PIMA, PINAL, GILA, MARICOPA

HABITAT: NESTS IN CANYONS AND DENSE FORESTS WITH MULTI-LAYERED FOLIAGE STRUCTURE

GENERALLY NESTS IN OLDER FORESTS OF MIXED CONIFER OR PONDERSA PINE/GAMBEL OAK TYPE, IN CANYONS, AND USE VARIETY OF HABITATS FOR FORAGING. SITES WITH COOL MICROCLIMATES APPEAR TO BE OF IMPORTANCE OR ARE PREFERED. CRITICAL HABITAT WAS REMOVED IN 1998 BUT RE-PROPOSED IN JULY 2000 AND FINALIZED IN FEB 2001 FOR APACHE, COCHISE, COCONINO, GRAHAM, MOHAVE, PIMA COUNTIES; ALSO IN NEW MEXICO, UTAH, AND COLORADO.

NAME: SOUTHWESTERN WILLOW FLYCATCHER *EMPIDONAX TRAILLII EXTIMUS*

STATUS: ENDANGERED CRITICAL HAB Yes RECOVERY PLAN: No CFR: 60 FR 10694, 02-27-95

DESCRIPTION: SMALL PASSERINE (ABOUT 6") GRAYISH-GREEN BACK AND WINGS, WHITISH THROAT, LIGHT OLIVE-GRAY BREAST AND PALE YELLOWISH BELLY. TWO WINGBARS VISIBLE. EYE-RING FAINT OR ABSENT.

ELEVATION RANGE: <8500 FT.

COUNTIES: YAVAPAI, GILA, MARICOPA, MOHAVE, COCONINO, NAVAJO, APACHE, PINAL, LA PAZ, GREENLEE, GRAHAM, YUMA, PIMA, COCHISE, SANTA CRUZ

HABITAT: COTTONWOOD/WILLOW & TAMARISK VEGETATION COMMUNITIES ALONG RIVERS & STREAMS

MIGRATORY RIPARIAN OBLIGATE SPECIES THAT OCCUPIES BREEDING HABITAT FROM LATE APRIL TO SEPTEMBER. DISTRIBUTION WITHIN ITS RANGE IS RESTRICTED TO RIPARIAN CORRIDORS. DIFFICULT TO DISTINGUISH FROM OTHER MEMBERS OF THE EMPIDONAX COMPLEX BY SIGHT ALONE. TRAINING SEMINAR REQUIRED FOR THOSE CONDUCTING FLYCATCHER SURVEYS. CRITICAL HABITAT ON PORTIONS OF THE 100-YEAR FLOODPLAIN ON SAN PEDRO AND VERDE RIVERS; WET BEAVER AND WEST CLEAR CREEKS, INCLUDING TAVASCI MARSH AND ISTER FLAT; THE COLORADO RIVER, THE LITTLE COLORADO RIVER, AND THE WEST, EAST, AND SOUTH FORKS OF THE LITTLE COLORADO RIVER, REFERENCE 60 CFR:62 FR 39129, 7/22/97.

LISTED, PROPOSED, AND CANDIDATE SPECIES FOR THE FOLLOWING COUNTY: MARICOPA

02/26/2001

NAME: YUMA CLAPPER RAIL *RALLUS LONGIROSTRIS YUMANENSIS*

STATUS: ENDANGERED CRITICAL HAB No RECOVERY PLAN: Yes CFR: 32 FR 4001, 03-11-67; 48 FR 34182, 07-27-83

DESCRIPTION: WATER BIRD WITH LONG LEGS AND SHORT TAIL. LONG SLENDER DECURVED BILL. MOTTLED BROWN ON GRAY ON ITS RUMP. FLANKS AND UNDERSIDES ARE DARK GRAY WITH NARROW VERTICAL STRIPES PRODUCING A BARRING EFFECT.

ELEVATION RANGE: <4500 FT.

COUNTIES: YUMA, LA PAZ, MARICOPA, PINAL, MOHAVE

HABITAT: FRESH WATER AND BRACKISH MARSHES

SPECIES IS ASSOCIATED WITH DENSE EMERGENT RIPARIAN VEGETATION. REQUIRES WET SUBSTRATE (MUDFLAT, SANDBAR) WITH DENSE HERBACEOUS OR WOODY VEGETATION FOR NESTING AND FORAGING. CHANNELIZATION AND MARSH DEVELOPMENT ARE PRIMARY SOURCES OF HABITAT LOSS.

EXHIBIT D—BIOLOGICAL RESOURCES

EXHIBIT D – BIOLOGICAL RESOURCES

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

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

RESOURCE OVERVIEW

Descriptions of the ecological communities present in and around the project area has been included in Exhibit C, Areas of Biological Wealth.

INVENTORY METHODS AND RESULTS

Inventory methods for biological resources included review of aerial photography (2001), literature searches, field reconnaissance, and temporary live trapping of small mammals at the proposed project site. Tables D-1, D-2, D-3, and D-4 contain lists of plant life, mammals, birds, and reptiles and amphibians potentially present in the vicinity of the project area.

ASSESSMENT METHODS AND RESULTS

Construction and operation of the proposed generating facility, natural gas pipeline lateral, and 500kV transmission line interconnect would result in some vegetation clearing and associated habitat loss; disturbance, injury, or mortality from construction activities; and avian collision hazard.

Construction activities would occur in the creosote bush flats, the xeroriparian community, and the agricultural fields. No ground disturbance would occur in the wetlands. Creosote lands would be cleared to build the generating facility and the evaporation ponds (if needed) and for construction staging. Disturbance would mainly occur in the creosote community areas. The creosote community is common in the project area, and generally characterized by low biodiversity. The proposed transmission line interconnect would be located along an existing roadway that is surrounded by cultivated areas and grazing land. Installation of the proposed pipeline lateral would require some minimal disturbance near the mesquite bosque. Temporary disturbance of wildlife would occur in the proximity of construction activities associated with each of the proposed facilities. Areas particularly sensitive to such disturbance are those where wildlife congregate, such as wetlands and the xeroriparian Centennial Wash. The dense xeroriparian area associated with Centennial Wash, along the eastern boundary of Section 1 would be directionally bored for pipeline installation to minimize disturbance. Wildlife that inhabit the irrigation return basin bordering Section 1, T2N, R11W may be disturbed by construction-generated noise. Noise disturbance may interrupt foraging and breeding behavior and may cause some animals to at least temporarily leave the basin. Similarly, wildlife may be temporarily displaced from the proposed pipeline lateral and/or 500kV transmission line interconnect route areas during construction.

Another construction-related effect is the potential for incidental injury or mortality of small animals in the path of construction equipment. Small mammals and reptiles are particularly vulnerable to injury or mortality during construction. Heavy equipment may destroy burrows and crush the animals inside.

Birds in the vicinity of the proposed generating facility may be injured or killed by colliding with conductors of the proposed transmission line interconnect. Due to the large distance between conductors on the proposed transmission line, electrocution of birds is extremely unlikely. Larger birds, such as eagles, hawks, and waterfowl are more vulnerable to collision hazard than smaller birds (Faanes 1987).

Adult resident birds may become habituated to the conductors; however, young birds and migrating birds are more susceptible to collision (Meyer 1978).

The creation of evaporation ponds in an arid setting would prove an attractant to all forms of wildlife. However, high salinity due to evaporation and low water quality may limit its use and productivity.

CONCLUSIONS

The proposed project would not result in adverse impacts on the biological resources within the area. The biological resources inventoried at the site were determined from a literature review and from extensive fieldwork. The resources are typical of a disturbed creosote-crucifixion thorn community of the Upland Sonoran association. Grazing has reduced several native plant annuals and exotic species have become established. This has caused the loss of native vertebrate species as well. The plant and wildlife communities that will be removed due to the proposed project are widespread; however, they are not critical to any threatened or endangered species. Additional disturbance to wildlife and plants may occur during construction of the proposed project, but this will be temporary. Revegetation of areas disturbed during construction will be effective in reducing the overall impact to biological resources in the area.

TABLE D-1
PLANT SPECIES THAT POTENTIALLY OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Creosote Bush Flats	Xero-riparian Washes	Wetlands	Agriculture Fields
Cattail	*Typha angustifolia*			✔	
Three square bulrush	*Scirpus americanus*			✔	
Bermuda grass*	*Cynodon dactylon*	✔	✔	✔	✔
Arabian grass*	*Schismus arabicus*	✔	✔		
Mediterranean grass*	*Schismus barbatus*	✔	✔		
Buckwheat	*Eriogonum* spp.	✔	✔		
Wingscale	*Atriplex canescens*	✔			
Quail brush	*Atriplex lentiformes*	✔			
All scale	*Atriplex polycarpa*	✔			
Russian thistle*	*Salsola iberica*		✔	✔	✔
Palmer's amaranth	*Amaranthus almeri*	✔	✔	✔	
Yellow tansy mustard	*Descurainia pinnata*	✔	✔	✔	✔
London rocket*	*Sisymbrium irio*		✔	✔	✔
Catclaw acacia	*Acacia greggii*		✔		
Velvet mesquite	*Prosopis velutina*		✔	✔	
Foothill paloverde	*Cercidium microphyllum*		✔		
Blue paloverde	*Cercidium floridum*	✔	✔		
White ratany	*Krameria grayi*	✔	✔		
Filaree*	*Erodium cicutarium*	✔	✔	✔	✔
Creosote bush	*Larrea tridentata*	✔	✔		
Corona de Cristo	*Castela emoryi*		✔		
Ditaxis	*Argythamnia neomexicana*		✔		
Graythorn	*Zizyphus obtusifolia*	✔	✔		
Alkali pink, globe mallow	*Sphaeralcea spp.*		✔	✔	✔
Tamarisk, salt cedar*	*Tamarix pentandra*	✔		✔	

TABLE D-1
PLANT SPECIES THAT POTENTIALLY OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Creosote Bush Flats	Xero-riparian Washes	Wetlands	Agriculture Fields
Cholla cactus	*Opuntia* spp.	✔	✔		
Ocotillo	*Fouquieria splendens*	✔	✔		
Wolfberry	*Lycium* spp.		✔		
Desert willow	*Chilopsis linearis*	✔	✔		
Triangle-leaf bursage	*Ambrosia deltoidea*	✔	✔		
White bursage	*Ambrosia dumosa*		✔		
Desert broom	*Baccharis sarothroides*	✔	✔		
Brittle bush	*Encelia farinosa*	✔	✔		
Alkali goldenbush	*Haplopappus acradenius*	✔	✔		
Jimmy weed	*Haplopappus heterophyllus*	✔	✔		
Arrowweed	*Pluchia sericea*				

Sources: Kearney and Peebles 1960, Lehr 1978, Turner and Brown 1994.
*Not native to Arizona

TABLE D-2
MAMMAL SPECIES THAT POTENTIALLY OCCUR IN THE PROJECT AREA AND THEIR HABITAT ASSOCIATIONS

Common Name	Scientific Name	Creosote Bush Flats	Xero-riparian washes	Wetlands	Agriculture Fields
Desert shrew	*Notiosorex crawfordi*	✔	✔		
California-leaf nosed bat	*Macrotus californicus*	✔	✔	✔	✔
Lesser long-nosed bat	*Leptonycteris curasoae*	✔	✔	✔	✔
Cave myotis	*Myotis velifer*	✔	✔	✔	✔
Yuma myotis	*Myotis yumanensis*			✔	
California myotis	*Myotis californicus*	✔	✔	✔	✔
Western pipistrelle	*Pipistrellus hesperus*	✔	✔	✔	✔
Big brown bat	*Eptesicus fuscus*	✔	✔	✔	✔
Townsend's big-eared bat	*Plecotus townsendii*	✔	✔	✔	✔
Pallid bat	*Antrozous pallidus*	✔	✔	✔	✔
Brazilian free-tailed bat	*Tadarida brasiliensis*	✔	✔	✔	✔
Western mastiff bat	*Eumops perotis*	✔	✔	✔	✔
Desert cottontail	*Sylvilagus audubonii*	✔	✔		✔
Black-tailed jackrabbit	*Lepus californicus*	✔	✔		✔
Harris' antelope squirrel	*Ammospermophilus harrisii*	✔	✔		

TABLE D-2
MAMMAL SPECIES THAT POTENTIALLY OCCUR IN THE PROJECT AREA AND THEIR HABITAT ASSOCIATIONS

Common Name	Scientific Name	Creosote Bush Flats	Xero-riparian washes	Wetlands	Agriculture Fields
Rock squirrel	*Spermophilus variegatus*	✔	✔		
Round-tailed ground squirrel	*Spermophilus tereticaudus*	✔	✔		
Botta's pocket gopher	*Thomomys bottae*	✔	✔	✔	✔
Arizona pocket mouse	*Perognathus amplus*	✔	✔		
Little pocket mouse	*Perognathus longimembris*	✔	✔		
Desert pocket mouse	*Chaetodipus penicillatus*	✔			
Rock pocket mouse	*Chaetodipus intermedius*		✔		
Bailey's pocket mouse	*Chaetodipus baileyi*	✔			
Desert kangaroo rat	*Dipodomys deserti*		✔		✔
Merriam's kangaroo rat	*Dipodomys merriami*	✔	✔		✔
Western harvest mouse	*Reithrodontomys megalotis*		✔	✔	
Cactus mouse	*Peromyscus eremicus*	✔	✔		
Deer mouse	*Peromyscus maniculatus*		✔		
Southern grasshopper mouse	*Onychomys torridus*	✔	✔		
Arizona cotton rat	*Sigmodon arizonae*		✔	✔	
White-throated wood rat	*Neotoma albigula*	✔	✔		
Desert wood rat	*Neotoma lepida*	✔	✔		
Coyote	*Cannes latrines*	✔	✔		✔
Kit fox	*Vulvas macerates*	✔	✔		✔
Gray fox	*Erosion cinereoargenteus*	✔	✔		✔
Raccoon	*Procyon lotor*			✔	
Ringtail	*Bassariscus astutus*		✔		
Badger	*Taxidea taxus*	✔	✔		
Spotted skunk	*Spilogale gracilis*		✔		
Bobcat	*Felis rufus*		✔	✔	
Mule deer	*Odocoileus hemionus*	✔	✔	✔	

Hoffmeister 1986.

TABLE D-3
BIRD SPECIES THAT POTENTIALLY OCCUR IN THE PROJECT AREA AND THEIR HABITAT ASSOCIATIONS

Common name	Scientific name	Creosote Bush Flats	Xero-riparian Washes	Wetlands	Agriculture Fields
Pie-billed grebe	*Podilymbus podiceps*			M	
Eared grebe	*Podiceps nigricollis*			M	
Double-crested cormorant	*Phalacrocorax auritus*			W, M	
Cattle egret	*Bubulcus ibis*			M	R
Green heron	*Butorides virescens*			M	
Black-crowned night heron	*Nycticorax nycticorax*			R	
White-faced ibis	*Plegadis chihi*			M	
Turkey vulture	*Cathartes aura*	S, M	S, M	S, M	S, M
Black-bellied whistling duck	*Dendrocygna autumnalis*			M	
Wood duck	*Aix sponsa*			W, M	
Green-winged teal	*Anas crecca*			W, M	
Mallard	*Anas platyrhynchos*			R	
Northern pintail	*Anas acuta*			W, M	
Blue-winged teal	*Anas dicors*			W, M	
Cinnamon teal	*Anas cyanoptera*			W, M	
Northern shoveler	*Anas clypeata*			W, M	
Gadwall	*Anas strepera*			W, M	
American wigeon	*Anas americana*			W, M	
Canvasback	*Anas valisineria*			W, M	
Redhead	*Anas americana*			W, M	
Ring-neck duck	*Aythya collaris*			W, M	
Lesser scaup	*Aythya affinis*			W, M	
Common goldeneye	*Bucephala clangula*			W, M	
Buffelhead	*Bucephala albeola*			W, M	
Common merganser	*Mergus merganser*			M	
Ruddy duck	*Oxyura jamaicensis*			W	
Osprey	*Pandion haliaetus*			W, M	
White-tailed kite	*Elanus leucurus*				W, M
Northern harrier	*Circus cyaneus*	W, M	W, M	R	R
Sharp-shinned hawk	*Accipiter striatus*		W, M		
Cooper's hawk	*Accipiter cooperii*		R		
Harris' hawk	*Parabuteo unicinctus*	R	R		R
Swainson's hawk	*Buteo swainsoni*	M	M		M
Red-tailed hawk	*Buteo jamaicensis*	R	R	R	R
Ferruginous hawk	*Buteo regalis*	W, M	W, M		W, M
American kestrel	*Falco sparverius*	R	R	R	R
Prairie falcon	*Falco mexicanus*	R	R	R	R
Gambel's quail	*Callipepla gambelii*	R	R	R	R
Clapper rail	*Rallus longirostris*			R	
American coot	*Fulica americana*			R	
Snowy plover	*Charadrius alexandrinus*			M	
Killdeer	*Charadrius vociferus*			R	R
Mountain plover	*Charadrius montanus*				W, M

TABLE D-3
BIRD SPECIES THAT POTENTIALLY OCCUR IN THE PROJECT AREA AND THEIR HABITAT ASSOCIATIONS

Common name	Scientific name	Creosote Bush Flats	Xero-riparian Washes	Wetlands	Agriculture Fields
Black-necked stilt	*Himantopus mexicanus*			W, M	
Greater yellowlegs	*Tringa melanoleuca*			W, M	
Spotted sandpiper	*Actitis macularia*			W, M	
Western sandpiper	*Calidris mauri*			M	
Least sandpiper	*Calidris minutilla*			W, M	
Long-billed dowitcher	*Limnodromus scolopaceus*			W, M	
Common snipe	*Gallinago*			W	
Wilson's phalarope	*Phalaropus tricolor*			M	
White-winged dove	*Zenaida asiatica*	S, M	R		R
Mourning dove	*Zenaida macroura*	R	R	R	R
Greater roadrunner	*Geococcyx californianus*	R	R	R	R
Western screech owl	*Otus kennicottii*		R		
Great-horned owl	*Bubo virginianus*		R		R
Elf owl	*Micrathene whitneyi*		S		
Burrowing owl	*Athene cunicularia*		R		R
Lesser nighthawk	*Chordeiles acutipennis*	R	R	R	R
Costa's hummingbird	*Calypte costae*		W, Sp		
Belted kingfisher	*Ceryle alcyon*			W, M	
Gila woodpecker	*Melanerpes uropygialis*	R	R		
Gilded flicker	*Colaptes chrysoides*	R	R	R	R
Black phoebe	*Sayornis nigrcans*			R	
Says phoebe	*Sayornis saya*	S, W	S, W		S, W
Ash-throated flycatcher	*Myiarchus cinerascens*		S		
Western kingbird	*Tyrannus verticalis*		R	S, M	S, M
Horned lark	*Eremophila alpestris*	R			R
Northern rough-winged swallow	*Stelgidopteryx serripennis*			S, M	
Cliff swallow	*Petrochelidon pyrrhonota*			S, M	
Common raven	*Corvus corax*	R	R		R
Verdin	*Auriparus flaviceps*	R	R		
Cactus wren	*Campylorhynchus brunneicapillus*	R	R		R
Black-tailed gnatcatcher	*Polioptila melanura*	R	R		
Northern mockingbird	*Mimus polyglottos*	R	R		R
Curve-billed thrasher	*Toxostoma curvirostre*		R		
American pipit	*Anthus rubescens*			W	W
Phainopepla	*Phainopepla nitens*		R		
Loggerhead shrike	*Lanius ludovicianus*	R	R		R
European starling	*Sturnis vulgaris*				R
Bell's vireo	*Vireo bellii*		S		
Warbling vireo	*Vireo gilvus*		M		
Lucy's warbler	*Vermivora luciae*		S		

TABLE D-3
BIRD SPECIES THAT POTENTIALLY OCCUR IN THE PROJECT AREA AND THEIR HABITAT ASSOCIATIONS

Common name	Scientific name	Creosote Bush Flats	Xero-riparian Washes	Wetlands	Agriculture Fields
Northern cardinal	*Cardinalis cardinalis*		R		
Brewers sparrow	*Spizella breweri*	W, M	W, M		W, M
Black-throated sparrow	*Amphispiza bilineata*		R		
White-crowned sparrow	*Zonotrichia leucophrys*	W, M	W, M		W, M
Red-winged blackbird	*Agelaius phoeniceus*			R	
Western meadowlark	*Sturnella neglecta*	R	R		R
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*			W	
Brewer's blackbird	*Euphagus cyanocephalus*				W
Great-tailed grackle	*Quiscalus mexicanus*			R	R
Brown-headed cowbird	*Molothrus ater*			R	R
House finch	*Carpodacus mexicanus*		R		R
House sparrow	*Passer domesticus*				R

Key to season birds expected:
Sp = Spring S = Summer W = Winter F = Fall M = Migration R = Resident
Sources: American Ornithologists Union 1998, Monson and Phillips 1981, National Geographic Society 1999, Witzeman et al. 1997.

TABLE D-4
REPTILE AND AMPHIBIAN SPECIES THAT POTENTIALLY OCCUR IN THE PROJECT AREA AND THEIR HABITAT ASSOCIATIONS

Common name	Scientific name	Creosote Bush Flats	Xero-riparian Wash	Wetlands	Agriculture Fields
Tiger salamander	*Ambystoma tigrinum*			✔	
TOADS					
Couch spadefoot	*Scaphiopus couchi*	✔	✔		✔
Western spadefoot	*Scaphiopus hammondii*	✔	✔		✔
Sonoran desert toad	*Bufo alvarius*	✔	✔	✔	✔
Woodhouse toad	*Bufo woodhousei*		✔	✔	
Red-spotted toad	*Bufo punctatus*		✔		
Great plains toad	*Bufo cognatus*	✔	✔	✔	
Lowland leopard frog	*Rana yavapaiensis*			✔	
Bull frog	*Rana catesbeiana*			✔	
TURTLES					
Sonoran mud turtle	*Kinosternon sonoriense*			✔	
Desert tortoise	*Gopherus agassizii*	✔	✔		
LIZARDS					
Western banded gecko	*Coleonyx variegatus*	✔	✔		
Desert iguana	*Dipsosaurus dorsalis*	✔	✔		

TABLE D-4 REPTILE AND AMPHIBIAN SPECIES THAT POTENTIALLY OCCUR IN THE PROJECT AREA AND THEIR HABITAT ASSOCIATIONS					
Common name	**Scientific name**	**Creosote Bush Flats**	**Xero-riparian Wash**	**Wetlands**	**Agriculture Fields**
Common chuckwalla	*Sauromalus obesus*				
Zebratail lizard	*Callisaurus draconoides*	✔			
Common collared lizard	*Crotaphytus collaris*		✔		
Long-nosed leopard lizard	*Gambelia wislizenii*	✔	✔		
Desert spiny lizard	*Sceloporus magister*	✔	✔		
Side-blotched lizard	*Uta stansburiana*	✔	✔		
Long-tailed brush lizard	*Urosaurus graciosus*	✔	✔		
Tree lizard	*Urosaurus ornatus*		✔		
Desert horned lizard	*Phrynosoma platyrhinos*	✔	✔		
Western whiptail	*Cnemidophorus tigris*	✔	✔		
Gila monster	*Heloderma suspectum*	✔	✔		
SNAKES					
Spotted leaf-nosed snake	*Phyllorhynchus decurtatus*	✔	✔		
Coachwhip	*Masticophis flagellum*	✔	✔		
Sonoran whipsnake	*Masticophis bilineatus*		✔		
Western patch-nosed snake	*Salvadora hexalepis*	✔	✔		
Glossy snake	*Arizona elegans*	✔	✔		
Gopher snake	*Pituophis melanoleucus*	✔	✔	✔	✔
Common kingsnake	*Lampropeltis getulus*	✔	✔		
Long-nosed snake	*Rhinocheilus lecontei*	✔	✔		
Ground snake	*Sonora semiannulata*		✔		
Western shovel-nosed snake	*Chionactus occipitalis*	✔	✔		
Night snake	*Hypsiglena torquata*	✔	✔		✔
Arizona coral snake	*Micruroides euryxanthus*	✔	✔		
Western diamondback rattlesnake	*Crotalus atrox*	✔	✔		
Sidewinder	*Crotalus cerastes*	✔	✔		
Mohave rattlesnake	*Crotalus scutulatus*	✔	✔		
Source: Stebbins 1985.					

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

EXHIBIT E – SCENIC AREAS, HISTORIC SITES AND STRUCTURES, AND 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."

SCENIC AREAS/VISUAL RESOURCES

The proposed project is located within the Basin and Range physiographic province (Fennemen, 1931), which is distinguished by isolated, roughly parallel, east-west trending mountain ranges separated by vast desert basins. The surrounding mountain ranges provide greater visual interest and diversity in terms of landform, texture, and color, while the basin areas are relatively flat with scenic areas limited to dissecting washes where a higher density and diversity of vegetation occurs. The basin area landscapes are generally vast and open, permitting expansive views and vistas of adjacent mountains.

The proposed project is located at the northwestern end of the Harquahala Plains (Valley). Much of this area contains typical Sonoran desert landscape consisting of relatively flat terrain, sparse vegetation, and numerous small drainages. There is some dispersed residential development, agricultural land, Interstate 10, and industrial facilities (e.g., CAP canal, Palo Verde-Devers 500kV transmission line, EPNG pipelines, water recharge facility). Distant mountain ranges surrounding the project area include the Big Horn Mountains to the northeast, Eagletail Mountains to the south, and Little Harquahala Mountains to the northwest.

The proposed project would be located on land owned by Allegheny. Adjacent land north and west of the proposed site is privately owned. ASLD owns the land to the east and south of the generating facility site, while BLM owns the land to the southeast and southwest of the site. The proposed project is entirely within La Paz County. While there are no formal guidelines for managing visual resources on ASLD, private, or La Paz County land, BLM has established comprehensive guidelines to manage visual resources for land under their jurisdiction. The appropriate BLM guidelines are discussed in detail in the following sections.

Potential impacts on visual resources resulting from the proposed project are predicted to range from moderate to low. Strategic siting of the facility in landscapes with minimal scenic quality, existing industrial development, and few high sensitivity viewers (e.g., residences and recreation areas) has resulted in overall visual impacts which would be lower than those typically expected for a generating facility and 500kV transmission line interconnection. Additionally, the application of mitigation measures including surface treatment (i.e., dulled or painted finish) for the facilities, revegetation/landscaping, and shielding and directive devices for plant lighting would effectively reduce potential impacts on visual resources.

INVENTORY METHODS

The sphere of influence for visual resources included areas within 2 miles of the proposed generating facility site, 500kV transmission line interconnect, and switchyard. There were specific cases where viewing conditions were evaluated up to 5 miles from the generating facility site due to the sensitivity of the use (e.g., the Eagletail Wilderness).

Inventory methods for this analysis were based on the BLM Visual Resource Inventory and Contrast Rating System (BLM 8400 Series Manual, 1986) and adapted to the specific issues related to construction and operation of the proposed project. The visual resources inventory included assessing scenic quality (including existing visual conditions), selecting sensitive viewpoints or key observation points (KOPs), and reviewing BLM Visual Resource Management (VRM) Classes.

Scenic Quality

Determining the scenic quality of a given landscape includes evaluating the character and diversity of landform, vegetation, water, color, adjacent scenery, and cultural or manmade features. Based on these elements, the project area was divided into the following units to identify the relative scenic value of a landscape:

- Class A (lands of outstanding or distinctive diversity or interest)
- Class B (lands of common or average diversity or interest)
- Class C (lands of minimal diversity or interest)

Class A represents the highest scenic value and C the lowest. An important aspect of evaluating scenic quality is documenting existing visual conditions and modifications present in the landscape like existing transmission lines, pipelines, roadways, and other industrial features that may influence the scenic quality in a given landscape.

Key Observation Points (KOPs)

KOPs are viewing locations that are representative of the most sensitive viewers that would view the proposed project. The inventory of KOPs included the following three components:

- identification of KOPs
- viewer sensitivity
- project visibility (seen areas and distance zones).

KOPs were identified based on review of available land use data, field review, public and agency review, and previous environmental studies in the region of influence. Additionally, a general inventory of other sensitive viewing areas was documented to account for distant viewers who would see the project facilities but not be significantly impacted.

Viewer sensitivity is a measure of the degree of concern for change in the visual character of a landscape. Viewer sensitivity is determined by evaluating type of use, user attitude, volume of use, influence of adjacent land use, and viewing duration. Two levels of sensitive views were evaluated for this project—high and moderate. Low sensitivity views were not evaluated since they would not result in significant visual impacts.

Visibility reflects how the proposed project would be seen and what distance it is from a particular KOP or viewing area. There were three distance zones defined within the region of influence, as follows:

- Foreground views: 0 to 1 mile

- Middleground views: 1 to 3 miles
- Background views: 3 to 5 miles (views beyond 5 miles are considered outside the visual sphere of influence)

BLM VRM Classes

Visual resources are land, water, vegetation, animals, and other visible features of an area. A VRM class contains specific objectives for maintaining or enhancing visual resource values (Palo Verde-Devers EIS, 1979). Visual sensitivity levels define the importance and guidance of management to the land. The following is a summary of the VRM Classes.

Class I—The objective of this class is to preserve the existing character of the landscape. Changes to the landscape character must be low and should not be evident.

Class II—The objective of this class is to retain the existing character of the landscape. Changes to the landscape character may attract slight attention, but should be subordinate to the visual setting.

Class III—The objective of this class is to partially retain the existing character of the landscape. Changes to the landscape character may begin to attract attention, but should not dominate the visual setting.

Class IV—The objective of this class is to allow for activities that modify the existing character of the landscape. Changes to the landscape character my attract attention and dominate the visual setting. However, these activities should minimize changes to the landscape where possible.

According to the BLM Palo Verde-Devers 500kV Transmission Line EIS, the VRM classification for project area is Class III. The Eagletail Mountains are located outside of the project area and are considered VRM Class II.

INVENTORY RESULTS

The inventory of visual resources identified several scenic quality units and KOPs (Figure E-1). Scenic quality in the area was predominantly Class C desert scrub landscapes. Class B landscapes included Centennial Wash and agricultural land. The Eagletail Mountains are a Class A landscape, however, they are located outside the visual sphere of influence. There were five KOPs identified including residences, Interstate 10, and an access point into the Eagletail Mountains Wilderness. The following sections describe the scenic quality and KOPs located within the visual sphere of influence for the proposed generating facility site, transmission line interconnect, and pipeline lateral.

Proposed Generating Facility Site

Scenic Quality

The generating facility site is located on a Class C scenic quality landscape characterized by flat terrain with typical desert scrub vegetation primarily consisting of creosote and grasses. The darker green vegetation contrasts with the tan soils adding minimal diversity to the landscape. The desert scrub landscape is relatively indistinctive in terms of scenic quality within the northern Harquahala Valley. Much of area surrounding the proposed generating facility site consists of Class C desert scrub landscapes as well.

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Agricultural land located to the east, south, and west of the generating facility site is considered Class B scenic quality. When in production the dark green vegetation contrasts with the surrounding desert scrub landscapes adding to the visual interest within the landscape. Currently, the agricultural land is fallow and offers minimal diversity and scenic value and could be considered Class C scenic quality.

Centennial Wash crosses the southwestern corner of the generating facility site. This ephemeral wash is a distinctive landscape in the project area and is considered to be Class B scenic quality. The wash is characterized by a dense cover of vegetation including creosote, mesquite trees, tamarisk, and crucifixion thorn. Water is present in the wash during and after periods of intense rainfall and/or runoff, which adds to the visual interest within the landscape. Additionally, there are stock tanks within the wash, which collect water and support a variety of typical wetland vegetation such as cattails and arrowweed.

The desert plains landscape located to the south of Centennial Wash is relatively flat approaching the Eagletail Mountains. This landscape consists of moderately dense cover of vegetation including palo verde trees, mesquite trees, ironwood trees, saguaro cactus, and brittlebush. The soils and small rock outcroppings are primarily tan interspersed with areas of gray/white. This landscape is considered to be Class B due to the diversity of vegetation, which adds visual interest in terms of contrasting colors and textures.

The Eagletail Mountains are located approximately 6 to 7 miles south of the proposed generating facility site. The Eagletail Mountains are considered Class A scenic quality because of the diversity in landforms, colors, and textures. Topography in the Eagletail Mountains "varies from flat or greatly undulating to strikingly incised and dissected." (Lower Gila South, [1985] BLM). This landform is a dominant feature in the landscape due to its distinctive ridgeline and dark brown colored rocks, which contrast with the adjacent tan soils.

Key Observation Points (KOPs)

There were five KOPs identified in the field including residences, highways, and recreation areas:

- KOP #1—Snowbird RV Park (high sensitivity)
- KOP #2—single residence south of the CAP Canal and west of Avenue 75E (high sensitivity)
- KOP #3—Interstate 10 eastbound approximately 1 to 2 miles from exit 69 at Avenue 75E (moderate sensitivity)
- KOP #4—Interstate 10 westbound approximately 1 mile from exit 69 at Avenue 75E (moderate sensitivity)
- KOP #5—Eagletail Mountain Wilderness access area (high sensitivity)

Middleground views (approximately 2.5 miles) of the proposed generating facility site from ***KOP #1 – Snowbird RV Park*** would be predominantly screened by the CAP Canal located 0.75 mile to the south. The canal is elevated approximately 15 feet above grade, reducing visibility of landscapes to the south. A 500kV transmission line is visible to the south from the RV park. The Little Horn, Big Horn, and Harquahala Mountains to the north and east are the dominant landscape features visible from the RV park. There are about 75 to 100 spaces available in the RV park, and they are primarily occupied from late fall to early spring.

KOP #2 – Single residence located approximately 1 mile north of the Interstate 10/Avenue 75E interchange has middleground views (approximately 1.75 to 2 miles away) of the generating facility site across open desert scrub and Interstate 10. Additionally, there are open views of the Eagletail Mountains to the south. Landscape modifications visible in the foreground from this residence including an existing 500kV transmission line, the CAP Canal, and the Interstate 10/Avenue 75E interchange. These modifications tend to be dominant in the landscape.

The generating facility site is viewed in the foreground to middleground (approximately 1 to 2 miles) while ***traveling eastbound (KOP #3) and traveling westbound (KOP #4) along Interstate 10***. Views in both directions are not oriented toward the proposed generating facility site, however the site would be open when viewing south. The surrounding Little Horn, Big Horn, Eagletail and Harquahala Mountains are distinct landscape features visible in all directions from Interstate 10. Traffic volume is approximately 10,000 to 20,000 vehicles per day (ADOT, 1996). A large percentage of this is heavy truck/transport traffic. There are no special scenic designations for Interstate 10. Existing modifications visible in the landscape from Interstate 10 include the CAP Canal, 500kV transmission line, water recharge facility, and the Avenue 75E interchange.

Although ***KOP #5 – Eagletail Mountains Wilderness access point*** is located outside of the 2-mile sphere of influence, it was included in the inventory due to its high sensitivity. Dispersed viewers within the Eagletail Mountains Wilderness access (hikers, bikers, and off-road vehicles) have partially to fully screened background views (approximately 4.5 miles away) of the proposed generating facility site. The partial screening is due to the presence of small to medium height trees and shrubs. The primary focal point from this viewpoint is the Eagletail Mountains. User volume is relatively low since the access to the area is remote and orientation of views is to the south away from the proposed generating facility. Visible modifications from this KOP include the existing pipeline corridor, 500kV transmission line, Interstate10, and CAP canal.

In addition to the KOPs described above, there were three additional viewing areas documented outside of the sphere of influence including Salome Road, the Eagletail Wilderness, and six residences to the southeast of the generating facility site.

Background views (approximately 4.5 to 5 miles away) from Salome Road are partially to fully screened due to the elevated nature of the CAP Canal and the existing 500kV transmission line dominating foreground views. Dispersed recreation users (e.g., hikers, backpackers, hunters) within the Eagletail Mountains have potential open to completely screened views of the proposed generating facility site as well as the pipeline corridor, existing 500kV transmission line, and Interstate 10. Views within the mountains are typically focused on features within the mountains or to adjacent mountain ranges. Six residences to the south of Centennial Wash have background views (approximately 4.5 miles away) of the proposed generating facility site. These views would be partially to fully screened due to the density of vegetation in Centennial Wash. Additionally, the Eagletail Mountains to the south are the focal point of the landscape from these residential views. Background views (approximately 4.5 miles away) are from the residences to the southeast of the generating facility site.

BLM VRM Classes

The proposed generating facility is not located on BLM land, except for the well field, which would be located on BLM VRM Class III landscapes. Allegheny is anticipating acquiring the 480 acres of land in Section 1, T2N, R11W through a land exchange with BLM. If the land exchange proceeds, the land would not fall under the jurisdiction the BLM VRM classification system. Landscapes to the south of the generating facility and well field managed by the BLM are also designated VRM Class III.

Proposed 500kV Transmission Line Interconnect (Route A)

The proposed transmission line interconnect consists of 1.5 miles of 500kV transmission line connecting with the existing Palo Verde-Devers line directly north of the generating facility site. Development and modifications surrounding the 2 miles of inventory area includes scattered residences, water recharge facility, CAP canal, Interstate 10, and interchange off Avenue 75E.

Scenic Quality

The proposed transmission line interconnect would cross scenic quality Class B agricultural landscapes and Class C desert scrub landscapes. Additionally, the proposed transmission line interconnect would cross Interstate 10 near the Avenue 75E interchange. Class B agricultural landscapes consist of dark green vegetation, which contrasts with the surrounding desert scrub landscapes adding to the visual interest within the landscape. Currently, the agricultural land is fallow and offers minimal diversity and scenic value (Class C scenic quality). The Class C desert scrub landscape is characterized by flat terrain with typical desert scrub vegetation primarily consisting of creosote and grasses. The darker green vegetation contrasts with the tan soils adding minimal diversity to this landscape. This desert scrub landscape is relatively indistinctive in terms of scenic quality within the northern Harquahala Valley.

KOPs

KOP #1 – Snowbird RV Park—The elevated nature of the CAP canal reduces visibility of landscapes to the south. Views toward the Eagletail Mountains consist of a perpendicular view of the existing Palo Verde-Devers 500kV transmission line (approximately 1 mile away) as well as Interstate 10 (approximately 2 miles away) and the Avenue 75E interchange. The proposed point of interconnection is approximately 1 mile south of KOP #1, thus being within foreground/middleground distance zones. Vegetation of the area consists of desert scrub flat terrain and does not offer additional screening potential.

KOP #2 – Single residence south of the CAP Canal and west of Avenue 75E—The proposed transmission line would be viewed in the foreground approximately 1,500 feet from the proposed point of interconnection. Modifications visible from this KOP include a 500kV transmission line and Interstate 10 to the south, and the CAP Canal to the north. The landscape to the south is low-lying desert scrub, which consists of light green vegetation and medium/light tan soils.

The proposed 500kV transmission line interconnect would be located along the east side of Avenue and the Exit 69 interchange. The transmission line would be viewed in the foreground (0 to 1 mile) and middleground (1 to 3 miles) distance zones from ***KOP #3 – Interstate 10 eastbound*** and ***KOP #4 – Interstate 10 westbound.*** Views from Interstate 10 include several dominant mountains to the north (e.g., Little Horn, Big Horn, and Harquahala), as well as the Eagletail Mountains to the south. There are several modifications visible in the foreground from both directions of travel. These modifications include the Palo Verde-Devers 500kV transmission line, the CAP canal, water recharge facility, the Exit 69 interchange, and several small utility lines.

KOP #5 – Eagletail Mountain Wilderness access area—Background views (5+ miles) of the proposed 500kV transmission line interconnect from the Eagletail Mountain Wilderness access area would be partially to fully screened due to intervening vegetation. Views from this area are oriented to the south toward the Eagletail Mountains. Visible modifications include the pipeline corridor, Interstate 10, Palo Verde Devers 500kV transmission line, and the CAP Canal.

Other areas with potential views of the proposed 500kV transmission line interconnect include residences to the south of Centennial Wash and travelers on Salome Road. The CAP Canal and Palo Verde-Devers 500kV transmission line partially screen background views (approximately 4.5 to 5 miles away) of the proposed transmission line interconnect from Salome Road. Background views (approximately 4.5 to 5 miles away) from scattered residences south of Centennial Wash are partially to fully screened by dense vegetation within Centennial Wash.

BLM VRM Classes

The proposed 500kV transmission line interconnect does not cross any lands managed by BLM. Landscapes to the south managed by BLM are designated VRM Class III.

Proposed Natural Gas Pipeline Lateral (Route B)

Scenic Quality

The proposed natural gas pipeline lateral crosses approximately 3 miles of Class B desert plains, 0.5 mile of Class B Centennial Wash, and 2 miles of Class C desert scrub landscapes.

KOPs

KOPs #1 and #2 would not have views of the pipeline due to intervening structures, terrain, and vegetation.

The proposed pipeline lateral would be visible in the middleground (1-3 miles away) and background (3-5.5 miles away) when viewing south from ***KOP #3 – Eastbound Interstate 10 and KOP #4 – Westbound Interstate 10***. Views from these KOPs would be partially to fully screened due to intervening vegetation (depending upon location of view from the roadway) and are not oriented toward the proposed pipeline lateral. The Eagletail Mountains are a dominant landscape feature when viewing to the south from these KOPs.

The proposed pipeline lateral would be visible in the background (4+ miles away) when viewing north from ***KOP #5 – Eagletail Mountain Wilderness***. Views would be open to fully screened depending upon viewing location within the wilderness. Views to various landscape features (e.g., Courthouse Rock) within the wilderness are the focal point from this KOP.

BLM VRM Classes

The proposed pipeline lateral does not cross any lands managed by BLM. Landscapes to the west of the proposed pipeline lateral that are managed by BLM are designated VRM Class III.

ASSESSMENT METHODOLOGY

The assessment of potential significant impacts on visual resources resulting from the proposed project was based on the evaluation of visual contrast as defied by the Visual Resource Inventory and Contrast Rating System (BLM 8400 Series Manual 1986).

Visual contrast is a measure of the perceptible level of change to landscape scenic quality and views from KOPs resulting from the proposed project. Viewing variables affecting visual contrast include vegetation or terrain screening, atmospheric conditions, daytime vs. nighttime conditions, and visual absorption capability (VAC). VAC is defined as the extent to which the complexity of the landscape can absorb

changes without affecting the overall visual character. Visual simulations were prepared using photography and computer-generated three-dimensional models to assist in determining visual contrast levels.

There were four visual contrast (modification) levels established for this project, as described below.

Not Noticeable— Changes in the landscape scenery or views that would not be evident (weak contrast) unless pointed out due to such factors as previous disturbance, distance, terrain and vegetation screening, dominance of adjacent landscape features, and visual absorption due to background terrain. Changes typically would be viewed in the background and would be unobstructed. However, middleground views may be included that are partially screened or foreground views that would be completely screened.

Noticeable— Changes in the landscape scenery or views that would be evident (weak/moderate contrast) but visually subordinate to the setting due to the factors described above. These changes may attract slight attention, but would not compete with adjacent landscape scenery or views. Changes typically would be viewed in the middleground or background and would be unobstructed. However, foreground views may be included that would be partially screened.

Co-dominant— Changes in the landscape scenery or views that would attract attention (moderate contrast) and begin to compete with adjacent landscape scenery or views. Changes typically would be viewed in the middleground and would be unobstructed or partially screened in the foreground.

Dominant— Changes in the landscape scenery or views that would become the focal point or most significant (strong contrast) feature in the setting. Changes typically would be viewed in the foreground, be unobstructed, and in extreme cases may be partially screened. Such changes often cause a lasting impression when viewed in the landscape.

The severity of impacts is determined by combining the landscape scenic quality classes and viewer sensitivity levels for KOPs, determined in the inventory with the visual contrast/modification levels described above. Tables E-1 and E-2 summarize the impacts in terms of high, moderate, and low levels.

There are four VRM classes (I, II, III, IV). Inventory Class I is assigned to special areas that are designated to maintain the naturalistic landscape. Classes II, III, and IV are based on three classifications; scenic quality, sensitivity level, and distance zones. A brief description of the VRM Classes is as follows:

- Class I—provides primarily for natural ecological changes
- Class II—changes in any of the basic elements should not be evident
- Class III—changes in the basic elements may be evident, but should remain subordinate
- Class IV—changes may subordinate original composition, but must reflect natural occurrence

Table E-3 summarizes compliance with BLM VRM Classifications.

TABLE E-1 SCENIC QUALITY IMPACT LEVELS			
Visual Contrast or Modification Levels	**Scenic Quality Class**		
	Class A	***Class B***	***Class C***
Not Noticeable	Moderate	Low	Low
Noticeable	Moderate	Moderate	Low
Co-dominant	High	Moderate	Low
Dominant	High	High	Moderate

TABLE E-2 KOP (VIEWER) IMPACT LEVELS			
Visual Contrast or Modification Levels	**Viewer Sensitivity**		
	High	***Moderate***	***Low***
Not Noticeable	Low	Low	Low
Noticeable	Moderate	Moderate	Low
Co-dominant	High	Moderate	Low
Dominant	High	High	Moderate

TABLE E-3 COMPLIANCE WITH BLM VRM CLASSIFICATIONS				
Visual Contrast or Modification Levels	**VRM Class**			
	Class I	***Class II***	***Class III ****	***Class IV***
Not Noticeable	Yes	Yes	Yes	Yes
Noticeable	No	Yes	Yes	Yes
Co-dominant	No	No	Yes /No**	Yes
Dominant	No	No	No	Yes/No**
* There are only VRM Class III landscapes in the region of influence ** Compliance may depend upon implementation of mitigation measures to reduce visual contrast				

There are four main components of the proposed project including the (1) generating facility, (2) 500kV transmission line interconnect, (3) 500kV switchyard, and (4) pipeline lateral. Each of the components have several features, which individually or in combination could result in impacts to visual resources. The features and their approximate dimensions are described below.

Generating Facility

- Combustion turbine and air inlet - approximately 75 feet high
- HRSG structure - approximately 106 feet high
- HRSG exhaust stack - approximately 150 feet high
- Steam turbine and generator - approximately 40 feet high
- Cooling towers - approximately 50 feet high
- Administration building - approximately 50 feet high

- Storage tanks - approximately 35 to 40 feet high
- Vapor plumes from cooling towers - variable dependent upon temperature and humidity

500kV Transmission Line

- Dulled finish steel lattice or single pole structures, approximately 120 to 130 feet high
- Non-reflective conductor (wires) and static lines

500kV Switchyard

- Chain link fence surrounding approximately 20 acres, approximately 6 to 10 feet high
- Switchyard equipment (variable) - approximately 20 to 120 feet high

Gas Pipeline Lateral

- Underground with approximately 50 feet of soil and vegetation disturbance

Mitigation Measures

The following mitigation measures will be implemented to reduce visual contrast resulting from the proposed project:

1. Landscaping at generation facility site (a conceptual landscape plan is in development)
2. Neutral color schemes for generation facility equipment
3. Revegetation of disturbed areas
4. Non-reflective steel for the transmission line/switchyard structures and conductors
5. Directive and shielding devices for lights required at the generation facility site, as well as motion detectors/electronic sensors for lights not needed for operational or safety reasons

ASSESSMENT RESULTS

Impacts on visual resources resulting from the proposed project are characterized as short-term during construction and long-term during operation and maintenance over the life of project. There would not be any high impacts on scenic quality or views for the proposed project. Impacts on scenic quality in the project area would be moderate to low because of (1) the predominance of landscapes with minimal or average scenic quality, (2) the presence of other industrial facilities (e.g., the existing 500kV transmission line, water recharge facility, and CAP Canal) and (3) the distant mountains, attracting the viewers attention away from the proposed project.

Impacts on views would range from moderate to low because of: (1) mitigation measures to reduce visual contrast of the proposed project, (2) screening from intervening vegetation, terrain, and structures, (3) distant views beyond 1 mile and relatively short viewing duration, and (4) the presence of other industrial facilities (e.g., the existing 500kV transmission line, water recharge facility, and CAP Canal).

Generating Facility Site

Scenic Quality

Modifications would range from *not noticeable* to *noticeable* primarily due to surface disturbance (soils and vegetation) and the introduction of industrial facilities into a scenic quality Class C desert scrub landscape at the proposed generating facility site. Impacts would be low after the implementation of mitigation measures 1 through 3 to reduce visual contrast.

KOPs

The proposed generating facility would be a *noticeable* feature in the landscape when viewed from ***KOP #1 – Snowbird RV Park*** (high sensitivity) approximately 2.75 miles away. The upper portions HRSGs (approximately 106 feet high) and exhaust stacks (approximately 150 feet high) would be the most visible due to their height. Overall, potential impacts would be moderate to low. Visibility of the generating facility site is limited due to the height of the flood control levee and CAP Canal located south of the RV Park. The existing Palo Verde-Devers 500kV transmission line parallels the landscape between the CAP Canal and Interstate 10, which would further reduce visual contrast of the proposed generating facility from this viewpoint. The most noticeable feature would be the presence of the lighting during the nighttime hours. However, impacts would be minimized with the application of mitigation measure 5.

The proposed generating facility would be *co-dominant* to *noticeable* from ***KOP #2 – Single resident south of the CAP Canal and west of Avenue 75E*** (high sensitivity). The HRSGs (approximately 106 feet high) and exhaust stacks (approximately 150 feet high) would be the most visible due to their height. Overall, potential impacts would be moderate with the application of mitigation measures 1 through 4 (Figure E-2). Views of the generating facility would be partially screened by Interstate 10, the Palo Verde-Devers 500kV transmission line, and low-lying terrain/vegetation. The Eagletail Mountains to the south are the dominant feature in the landscape when viewed from this KOP and would remain so after construction of the generating facility. Additionally, the Little Harquahala, Harquahala, and Bighorn Mountains are dominant landscape features visible to the to the north. Lighting would be the most noticeable feature of the proposed generating facility during nighttime hours. However, impacts would be minimized with the application of mitigation measure 5.

The proposed generating facility would be a *co-dominant* feature in the landscape when viewed from Interstate10, ***KOP #3 (eastbound, moderate sensitivity) and KOP #4 (westbound, moderate sensitivity).*** The generating facility would be approximately 1 mile from the facility at its closest point. Impacts from Interstate 10 would be moderate since it is not considered a scenic route and after the application of mitigation measures 1 through 4 Figures E-3 and E-4). Visible night lighting would be the most noticeable feature of the proposed generating facility. However, impacts would be minimized with the application of mitigation measure 5.

The proposed generating facility would range from *not noticeable* to *noticeable* feature in the landscape when viewed from ***KOP #5 – Eagletail Mountains Wilderness access area*** (high sensitivity) approximately 4 miles away (Figure E-5) Impacts resulting from the facility would be moderate to low primarily due to the distance and partial vegetation screening. The Eagletail Mountains would remain the most dominant feature in the landscape after the application of mitigation measures 1 through 5. The proposed generating facility would be visible at night due to lighting, however use of this access is primarily during daytime hours.

Remaining impacts on other viewing areas such as Salome Road, six residences to the southeast of the generating facility site, and Eagletail Wilderness would be low. The generation facility would range from

OVERSIZED MAP

-Visual Simulation
Color Scheme (proposed)
La Paz Generating Facility
Figure E-2

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OVERSIZED MAP

-Visual Simulation
Color Scheme (proposed)
La Paz Generating Facility
Figure E-3A

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OVERSIZED MAP

-Visual Simulation
Color Scheme 2
La Paz Generating Facility
Figure E-3B

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OVERSIZED MAP

-Visual Simulation
Color Scheme (Proposed)
La Paz Generating Facility
Figure E-4A

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OVERSIZED MAP

-Visual Simulation
Color Scheme 2
La Paz Generating Facility
Figure E-4B

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View Looking North from Entrance to Eagletail Wilderness

NOTE: Generating facility would be screened by existing vegetation

Visual Simulation

La Paz Generating Facility

Figure E-5

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noticeable to *not noticeable* due to viewing distances beyond 4 miles and partial to full screening from adjacent terrain and vegetation.

Vapor plumes emanating from the cooling towers would only occur under ideal conditions (i.e., low temperature and high humidity). Vapor plumes would be *noticeable* to *co-dominant* from the KOPs and other viewing areas when present. However, vapor plumes would occur infrequently (approximately 1 percent of the daytime hours) and would result in low impacts.

BLM VRM Classes

The generating facility would not impact BLM VRM classifications, since it is located on private land. The well field would not affect BLM VRM classification after the Allegheny acquires the 480 acres of BLM land in Section 1, T2N, R11W through the land exchange. However, the well field would be in compliance with BLM Class III landscapes since there would be minimal disturbance and visibility would be low.

Proposed 500kV Transmission Line Interconnection (Route A) and 500kV Switchyard

Scenic Quality

The proposed 500kV transmission line interconnect and switchyard would range from *noticeable* to *co-dominant* in Class B agricultural landscapes and Class C desert scrub landscapes. Impacts would be moderate when crossing the Class B agricultural landscapes and low when crossing the Class C desert scrub landscapes.

KOPs

The proposed 500kV transmission line interconnect and switchyard would range from *not noticeable* to *noticeable* when viewed from **KOP #1 – *Snowbird RV Park*** (high sensitivity) approximately 1 mile away. Views would be partially screened by the CAP Canal and Palo Verde-Devers 500kV transmission line. Impacts would be moderate to low depending upon viewer orientation within the RV park and after the application of mitigation measure 4.

The proposed 500kV transmission line interconnect and switchyard would be *co-dominant* when viewed from **KOP #2 – *Single resident south of the CAP Canal and west of Avenue 75E*** (high sensitivity) approximately 0.25 mile away. Impacts would initially be high to moderate due to the proximity of the features (the Palo Verde-Devers 500kV transmission line is located in the immediate foreground views of this residence); however, impacts would be reduced to moderate after the application of mitigation measure 4.

The proposed 500kV transmission line interconnect and switchyard would be *noticeable to co-dominant when* viewed from **KOP #3 – *Interstate 10 eastbound*** (moderate sensitivity) **KOP #4 – *Interstate 10 westbound*** (moderate sensitivity) approximately 1 to 2 miles away. The proposed 500kV transmission line interconnect crossing over Interstate 10 would be the most visible segment from each KOP. Impacts would be moderate due to the relatively short viewing duration and presence of existing modifications in the landscape, including the interchange and Palo-Verde Devers 500kV transmission line. Mitigation measure 3 would reduce the overall visual contrast within these views.

The proposed 500kV transmission line interconnect and switchyard would not be *noticeable* when viewed from **KOP #5 – *Eagletail Mountain Wilderness access area*** (high sensitivity) approximately 6 to 7 miles away. Impacts would be low after the application of mitigation measure 3.

BLM VRM Classes

The proposed 500kV transmission line interconnection and switchyard would not impact BLM VRM classifications, since it is located on private land and State land.

Proposed Natural Gas Pipeline Lateral (Route B)

Scenic Quality

The proposed pipeline lateral would be *noticeable* where it crosses Class C desert scrub landscapes to *co-dominant* where it crosses Class B Centennial Wash and desert plains landscapes south of Centennial Wash. Impacts would be low in the Class C landscapes and moderate in the Class B landscapes after the application of mitigation measure 3. Disturbance to Centennial Wash would be minimal since it will be crossed via directional boring.

The proposed pipeline lateral would be *not noticeable* from ***KOPs #1 (high sensitivity), #2 (high sensitivity), and #3 (moderate sensitivity)***, therefore impacts would be low. The proposed pipeline lateral would be noticeable from ***KOP #4 (moderate sensitivity)***, however impacts would be low due to the short duration. The proposed pipeline lateral would be noticeable from ***KOP #5 (high sensitivity)***, therefore impacts would be moderate.

BLM VRM Classes

The proposed pipeline lateral would not impact BLM VRM classifications, since it is located on private land.

Impacts to visual resources resulting during construction of the proposed project would range from moderate to low depending upon the presence of large scale construction equipment, dust, and lighting. Impacts would be short-term lasting from 18-24 months. Moderate impacts would primarily be from the nearest residence and Interstate 10. The remaining impacts would be low due to distance and screening from intervening terrain and vegetation. Mitigation measures such as lower cranes and scaffolding when not in use, use of dust control/suppressants (e.g., application of water), and using directive and shielding devices on lighting will help reduce the potential for impacts to visual resources.

CONCLUSIONS

The proposed project would not result in adverse impacts on visual resources. Impacts on scenic quality would be low in Class C desert scrub landscapes and moderate in Class B agricultural landscapes. Impacts on views from the nearest residence would be moderate considering the immediate foreground presence of the Palo Verde-Devers 500kV transmission line and after the application of mitigation measures. Impacts on views from recreation areas (e.g., Eagletail Mountains Wilderness) would be moderate to low since the views are located beyond 5 miles from the project and are partially to fully screened by terrain and vegetation. Impacts on views from Interstate 10 would be moderate since it is not a designated scenic route and is heavily influenced by other industrial facilities and the presence of numerous large trucks on the roadway. Overall visual impacts would be lower than those typically expected for a generating facility and 500kV transmission line interconnection.

HISTORIC SITES AND STRUCTURES AND ARCHAEOLOGICAL SITES

Methods

A cultural resources review was undertaken to address whether any archaeological sites or historic structures are present near the project area and how they might be affected by the proposed construction of the La Paz Generating Facility. The study was based on existing information from prior studies within about 2 miles of the proposed facilities. Maps, records, and files were reviewed at the following agencies and institutions:

- State Historic Preservation Office
- Arizona State Museum
- Department of Anthropology at Arizona State University
- State Office, Phoenix Field Office, and Yuma Field Office of the Bureau of Land Management

Findings

The results of the record search are summarized in this section. The complete technical report is included in Exhibit B-2.

Human societies have lived in Arizona for at least 10,000 years and perhaps longer. The earliest groups lived by hunting game and collecting indigenous plant foods. Populations remained small and dispersed for thousands of years during the Paleoindian and Archaic periods. Approximately 2,500 years ago, some occupants of the region adopted an agricultural way of life and began to grow crops such as corn, beans, squash, and cotton along drainages where sufficient water was available. The regional population began to grow and large, permanent villages appeared, primarily in valleys with surface water supplies. There is little evidence for large villages in more arid locations like west-central Arizona. Archaeological sites in these arid desert areas are usually scatters of artifacts that are the remains of briefly used camps and hunting and gathering locations.

When Europeans first arrived in the region they found numerous groups involved in complex trading and raiding relationships (Doyel 1989). Yuman-speaking Yavapais inhabited much of west-central Arizona north of the Salt and Gila rivers, O'odham groups lived south of the Gila River. Groups that came to be known as the Maricopa lived along the lower Gila and Colorado River valleys. In the nineteenth century the Maricopas moved east up the Gila River to join the Akimel O'odham (Pima). Apache bands inhabited the mountains east of the Phoenix area.

Euro-Americans found little of interest in the arid desert of west-central Arizona until precious minerals were discovered in some of the mountain ranges that dot the landscape. Spaniards reportedly found gold in the Harquahala Mountains as early as 1762, but no evidence of mining or settlement from that era has been found. After the United States acquired the territory, the mining camps of Harquahala and Harrisburg were established in the 1860s and 1880s some 15 to 17 miles north of the proposed La Paz Generating Facility. Harrisburg warranted a post office from 1880 to 1906, and Harquahala "boomed" in 1888, but most of the claims were exhausted in less than a decade. The community had a post office from 1891 to 1918. The mines were largely exhausted by the turn of the century but were sporadically worked into the 1930s.

Euro-Americans first established ranches in the Harquahala Plain in the late nineteenth and early twentieth centuries. E.H. Winters owned a ranch from 1885 to 1925, and was later memorialized when the town of Wintersburg was established near a well on the ranch. Wintersburg warranted a post office between 1930 to 1941, and a post office was established in Tonopah in 1934. There was a flurry of homesteading in the Palo Verde Hills area between the 1920s and the mid-1940s. The earliest of these were World War I veterans who had hopes of receiving government-sponsored aid for irrigation projects. Most attempts to rely on floodwater farming and wells failed, and most homesteaders who managed to obtain patents left after establishing their claims. Large, successful farms were developed on the Harquahala Plain only after World War II when deep wells made irrigation possible.

The record search identified and assessed information about archaeological and historical studies that have been conducted in conjunction with planning eight previous projects within 2 miles of the proposed La Paz Generating Facility. The most extensive studies were conducted during the planning of the Hayden-Rhodes Aqueduct (formerly known as the Granite Reef Aqueduct), a component of the Central Arizona Project. Other studies were conducted for the planning of the Palo Verde-Devers 500-kV transmission line, pipelines, a fiber optic cable, a road, and sale of state land.

These studies discovered and recorded six archaeological sites within the 33-square-mile record search area, but none are within the footprint of the proposed project facilities. All of the sites reflect aboriginal use of the region, but none of the sites yielded materials that could be chronometrically dated. The pottery at one site suggests a date of occupation between approximately AD 700 and 900, and another between AD 700 and 1050. One site also has some historic era trash of undetermined origin.

The sites are all quite simple, consisting of only a few artifacts and simple rock alignments that may be remnants of temporary shelters, as well as rock clusters, some of which may be remnants of hearths or cooking pits. The sites are primarily confined to the surface of the ground and extensive buried archaeological deposits have not been found at these types of sites. As a group, the sites seem to reflect sporadic exploitation of the natural resources of the region, and probably are related to hunting game or collecting and processing indigenous plant foods such as mesquite and palo verde seeds and cactus fruits. Other types of archaeological sites reported in the region include petroglyphs and trails visible across areas of desert pavement, as well as historic trash dumps and remnants of historic farmsteads.

An ethnographic study was conducted in support of the planning of the Palo Verde-Devers transmission line (Bean and Vane 1978). Maricopas and Yavapais who were interviewed identified traditional cultural associations with the Little Horn Mountains, Eagletail Mountains, and Courthouse Rock. Yavapais also identified plants traditionally used for food and medicine in the creosote bush vegetation communities of the Ranegras Plain and Harquahala Plain. The proposed La Paz Generating facility is on the Harquahala Plain and will result in some disturbance of native vegetation although much of the project area has already been altered by agricultural development. The project is not expected to have impacts on any of the other places identified as having traditional cultural associations.

GLO first surveyed the area in 1914, 1915, and 1934. These relatively late dates reflect the lack of interest in settlement and development of this arid, remote area. Only a few cultural features are depicted on the GLO plats, including a dry well (1914), and a couple of houses and one outbuilding (1934). Numerous road segments also are mapped, but only one of these is named. That road is identified as running between Phoenix and Harrisburg.

In summary, the early GLO plats indicate little historical development of the region. Only two cultural features are within the footprint of the proposed La Paz Generating Facility. One of the houses depicted on the 1934 plat is within the proposed well field, but whether any evidence of this building remains intact is not known. The proposed natural gas pipeline lateral would cross the alignment of an unnamed

road that was depicted on the 1914 GLO plat running along Centennial Wash. Floods may very well have obliterated evidence of this road at this crossing.

CONCLUSIONS

The record search indicates that archaeological and historical resources are not abundant in the vicinity of the proposed La Paz Generating Facility, and the archaeological sites that have been found in the region are relatively small and simple, reflecting limited aboriginal exploitation of the Harquahala Plain. Although the prior archaeological and historical studies have encompassed very little of the footprint of the proposed La Paz Generating Facility, they constitute approximately a 10 percent sample of the record search area and suggest an average of about 1 to 2 archaeological sites per square mile can be expected. The footprint of all the project facilities would encompass 1.5 to 2.0 square miles. Therefore, it can be estimated that about 1 to 4 archaeological sites might be present within the footprint of the project facilities.

Allegheny is planning to have an intensive survey conducted to further assess potential effects on archaeological and historical sites. The survey findings would be considered as project planning proceeds. If significant archaeological or historical sites are present in the well field or along the proposed transmission line interconnect corridor, there is good potential to avoid direct impacts by minor project design modifications. If significant resources could not be avoided, those impacts would be mitigated by undertaking studies to recover important information prior to construction.

REFERENCES

Bureau of Land Management (BLM). 1986. Visual Resource Management Inventory and Contrast Rating System.

U.S. Forest Service. 1974. Visual Management System.

U.S. Forest Service. 1995. Scenery Management System.

Personal communication with Mary Dahl, La Paz County. May 18, 2001.

EXHIBIT F—RECREATIONAL PURPOSE AND ASPECTS

EXHIBIT F-RECREATIONAL PURPOSES AND ASPECTS

As stated in Arizona Corporation Commission. Rules of Practice-and Procedure 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."

RECREATIONAL PURPOSES AND ASPECTS

There are currently no developed recreation resources within the project area. Adjacent and nearby land is currently being used for seasonal agricultural activities or is non-developed open space and will likely remain as such throughout the life of the proposed project. Dispersed activities such as off-road vehicle use occur in the surrounding area. The Eagletail Mountains Wilderness (a BLM-designated Class I recreational area) located approximately 6 to 7 miles from the proposed generating facility site creates opportunities for primitive and unconfined recreation such as hiking, backpacking, camping, hunting, cultural and botanical sightseeing, and horseback riding. The Eagletail Mountains Wilderness is the closest recreation area to the proposed generating facility.

Allegheny, La Paz County, the Arizona State Land Department, and BLM have not proposed any plans for the development of recreation facilities within the project area. The construction, operation, and maintenance of proposed project would be consistent with safety considerations, and would not be open to public access. Recreational use of lands crossed by the proposed 500kV transmission line interconnect or pipeline lateral would continue to be managed by any individual or agency currently managing those areas. If recreational development plans occur within the project area in the future, Allegheny will work with the appropriate planning authorities and community to accommodate them with due consideration of the proposed projects operational and maintenance requirements.

EXHIBIT G—CONCEPTUAL DRAWINGS OF PLANT FACILITIES

EXHIBIT G – CONCEPTUAL DRAWINGS OF PLANT FACILITIES

As required by A.A.C. R14-3-219 Applicant provides the following information:

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.

The following exhibits are provided:

Exhibit G-1	General Site Arrangement
Exhibit G-2	3-Dimensional Rendering
Exhibit G-3	South Elevation
Exhibit G-4	Planned View of Site
Exhibit G-5	Typical 500kV Lattice Structure (Proposed)
Exhibit G-6	Typical 500kV Steel Pole Structure

OVERSIZED MAP

-Exhibit G-1

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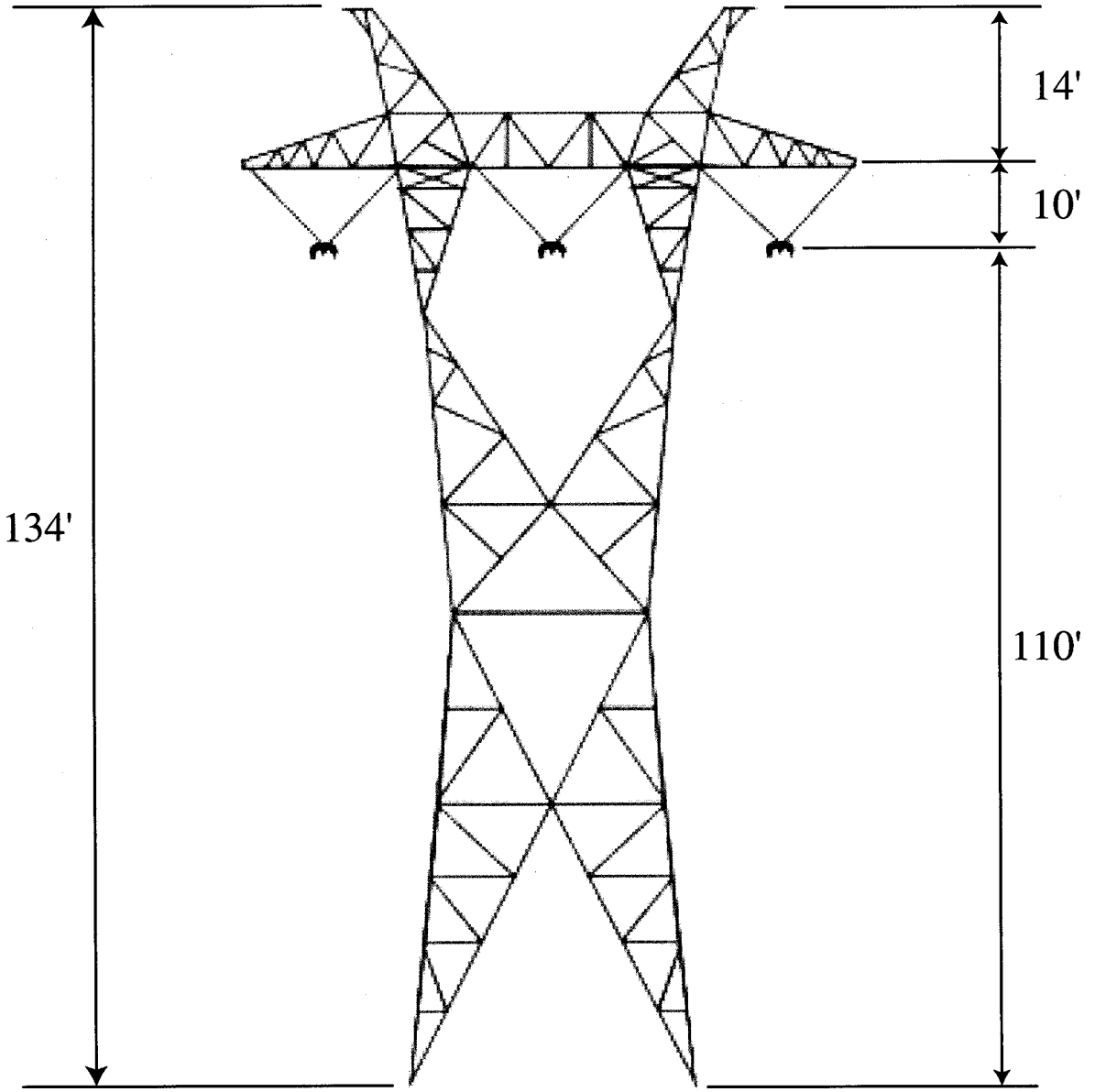

Typical 500kV Lattice Structure (Proposed)
La Paz Generating Facility

Exhibit G-5

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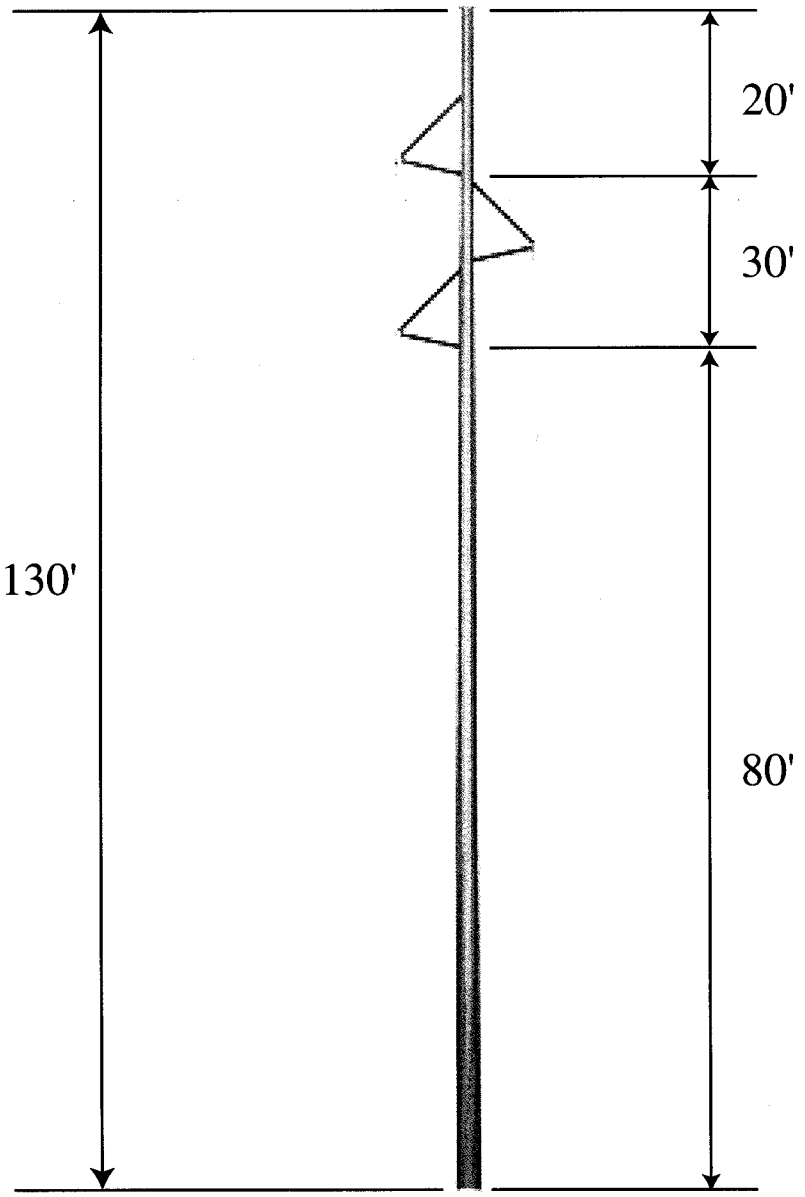

Typical 500kV Steel Pole Structure
La Paz Generating Facility

Exhibit G-6

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EXHIBIT H—EXISTING PLANS

EXHIBIT H-EXISTING PLANS

As stated in Arizona Corporation Commission Rules of Practice and Procedure 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."

Existing and planned land uses are described in Exhibit A. Exhibits A-3 and A-4 depict the existing and future land uses within the project area. Planned residential, commercial, recreation, or other developments were not identified within 1 mile of the proposed generating facility site. The proposed generating facility site is currently in the process of rezoning from RA-40 (Rural Residential, 40-acre lots) to HI (Heavy Industrial). Existing zoning surrounding the proposed project site is rural residential in both La Paz County and Maricopa County, with the exception of a parcel within Section 1, T2N, R11W that is zoned HI and owned by Allegheny.

BLM has identified several parcels of land within the project area for disposal in the *Final Amendment and Environmental Assessment to the Lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan* (February 2000). One of these parcels is immediately southeast of the generating facility site in Section 1, T2N, R11W. Allegheny is working with the BLM Yuma Field Office and Arizona State Office to acquire the 480 acres via a land exchange for private property within the Sears Point Area of Critical Environmental Concern (located southwest of Gila Bend, Arizona). The 480 acres would be used for development of a well field to supply the needed water for cooling purposes for the proposed generating facility. Additionally, the 480 acres would be used as a staging area for construction of the generating facility.

Although no formal plans exist, La Paz County has expressed interest in expanding commercial and industrial development in the area near Exit 69/Avenue 75E along Interstate 10. Vidler Water Company, Inc. is currently underway developing a water recharge facility approximately 1 mile west of the proposed generation facility site in Section 33, T3N, R11W.

EXHIBIT I—ANTICIPATED NOISE/INTERFERENCE WITH COMMUNICATION SIGNALS

ANTICIPATED NOISE INTERFERENCE WITH COMMUNICATION SIGNALS

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

"Describe the anticipated noise emission levels and any interference with communication signals which will emanate from the proposed facilities."

GENERATING FACILITY AUDIBLE NOISE

This section describes the existing noise environment on site and in the vicinity of the proposed plant, and assesses potential noise impacts associated with the proposed project. Noise-sensitive receptors that may be affected by project-related noise are identified, as well as the laws, ordinances, regulations, and standards (LORS) that regulate noise levels at those receptors. The following discussion describes the fundamentals of acoustics, the results of a detailed site reconnaissance, sound level measurements, acoustical calculations, and assessment of potential noise impacts from construction and plant operations.

Affected Environment

Fundamentals of Acoustics

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that disrupts or interferes with normal human activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day, and the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium such as air and are sensed by the human ear. Sound is generally characterized by a number of variables including frequency and intensity. Frequency describes the sound's pitch and is measured in Hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. An increase (or decrease) in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

$$60\ \text{dB} + 60\ \text{dB} = 63\ \text{dB}, \text{ and}$$

$$80\ \text{dB} + 80\ \text{dB} = 83\ \text{dB}$$

Hertz is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. A particular tone that makes the drum skin vibrate 100 times per second generates a sound

pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived as a tonal pitch of 100 Hz. Sound frequencies between 20 Hz and 20,000 Hz are within the range of sensitivity of the best human ear.

Sound from a tuning fork (a pure tone) contains a single frequency. In contrast, most sounds one hears in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound according to a weighting system that reflects that human hearing is less sensitive at low frequencies and extremely high frequencies than at the mid-range frequencies. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level (L_{eq}) is used. L_{eq} is the energy-mean A-weighted sound level during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a given source to equal the fluctuating level measured. In addition, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the L_{max} and L_{min} indicators. They represent the root-mean-square (RMS) maximum and minimum obtainable noise levels during the monitoring interval. The L_{min} value obtained for a particular monitoring location is often called the *acoustic floor* for that location.

To describe time-varying character of environmental noise, the statistical noise descriptors L_{10}, L_{50}, and L_{90} are commonly used. They are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of a stated time. Sound levels associated with the L_{10} typically describe transient or short-term events, while levels associated with the L_{90} describe the steady-state (or most prevalent) noise conditions.

Finally, another sound measure known as the Day-Night Average Noise Level (L_{dn}) is defined as the A-weighted average sound level for a 24-hour day. It is calculated by adding a 10-decibel penalty to sound levels in the night (10:00 p.m. to 7:00 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours. The L_{dn} is used by the State of California and the County of Colusa to define acceptable land use compatibility with respect to noise. Sound levels of typical noise sources and environments are provided in Table I-1 to provide a frame of reference.

Noise Standards

U.S. Department of Housing and Urban Development (HUD)

HUD Guidelines 24 CFR 51 subpart B has identified site acceptability standards for residential development. Exterior sound levels up to 65 dBA L_{dn} are considered to be acceptable. Sound levels between 65 dBA and 75 dBA L_{dn} are considered to be normally unacceptable. The standard is applied at locations where it is determined that quiet outdoor space is required in an area ancillary to the principal use of the site, such as rear yards.

Federal Transit Administration

Federal Transit Administration (FTA) Circular C5620.1 provides guidance for the evaluation of urban mass transportation projects related to the significance of environmental impacts. The CEC uses this guideline to evaluate the significance of noise impacts through the comparison of existing ambient noise

levels with the noise levels projected to result from a project. Generally speaking, an increase in noise of 3 dBA L_{eq} or less caused by a project represents no significant change. An increase of 10 dBA L_{eq} or more is considered a significant impact. If the increase in noise ranges between 3 and 10 dBA, its significance will depend upon the existing ambient noise and the proximity to noise sensitive receptors. In general, the CEC considers a project-related increase in noise of 5 dBA at noise sensitive receptors as significant.

Occupational Safety and Health Administration

Occupational exposure to noise is regulated by the Occupational Safety and Health Administration (OSHA) (29 CFR 1910.95). The standard stipulates that protection against the effects of noise exposure shall be provided when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure to the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average (TWA) sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping.

Local

La Paz County does not have an ordinance that regulates noise from power plants or other stationary noise sources.

Site Conditions

The proposed project site is located in an unincorporated area of La Paz County, Arizona. Most of the land within a 2-mile radius of the proposed generating facility site is rural agricultural land used for livestock grazing and open space consisting of typical desert vegetation. Interstate 10 runs in a east-west direction approximately 0.75 mile north of the project site.

Some land uses are considered sensitive to noise. Noise-sensitive receptors are land uses associated with indoor and outdoor activities that may be subject to stress or significant interference from noise. They often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, educational facilities, and libraries.

One residence is located approximately 1.75 miles north of the plant site. A trailer park is located approximately 2.75 miles north of the plant site. Four scattered residence are located approximately 4.5 miles southeast of the plant site. Noise at these receptors results primarily from vehicular traffic in and out of the resident's property and from distant vehicular traffic on Interstate 10.

The water recharge facility is located approximately 1 mile east of the plant site. Receptor locations are located on Figure I-1.

Ambient Sound Levels

Sound levels were measured on June 1, 2001 at the proposed site and at the closest noise-sensitive receptors to quantify the existing noise environment in the vicinity of the proposed plant. A Larson Davis Model 712 American National Standards Institute (ANSI) Type 2 Integrating Sound Level Meter was used as the data collection device. The meter was mounted on a tripod approximately 5 feet above ground

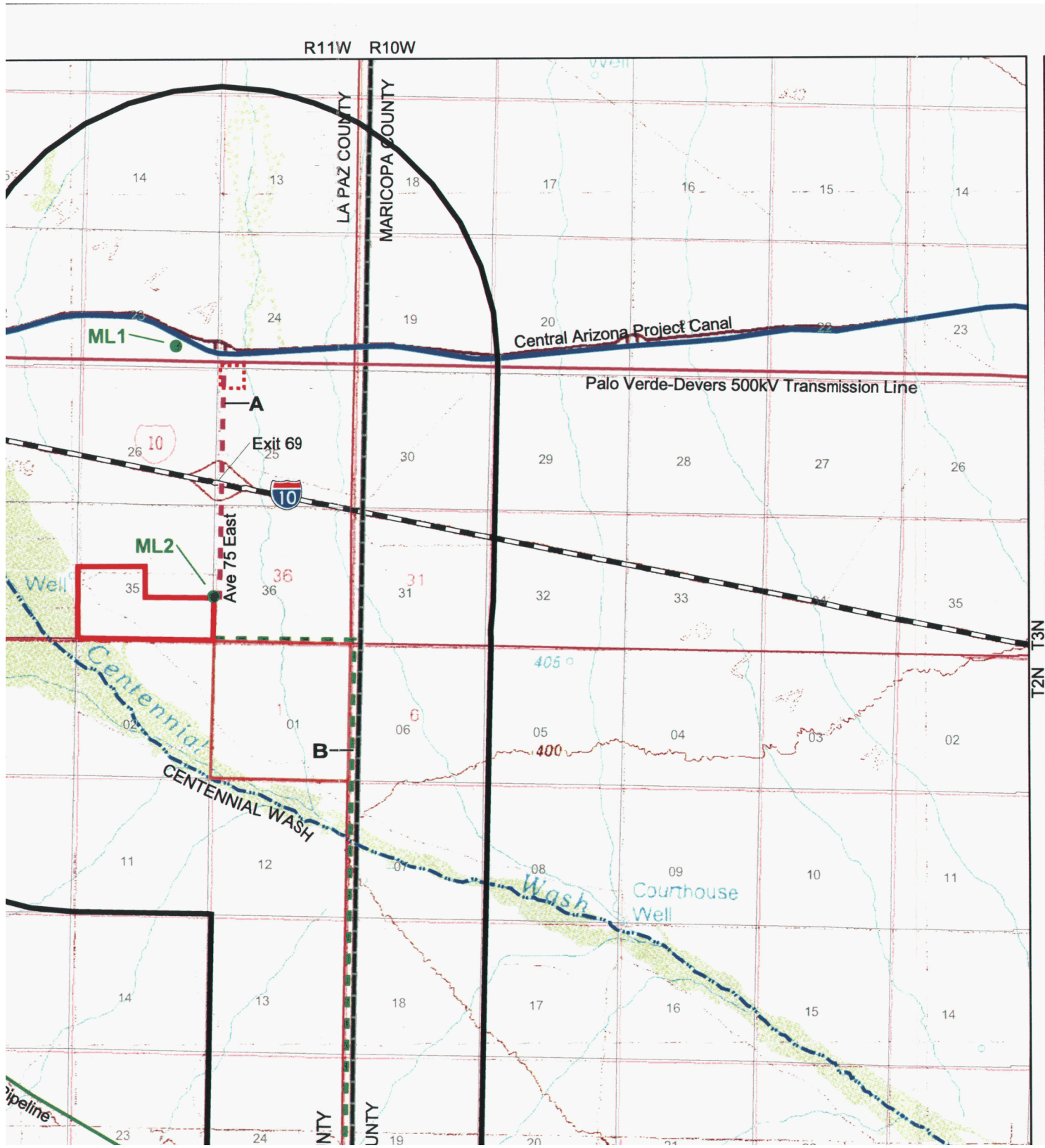


Figure I-1
Location of Noise Receptors

La Paz Generating Facility

Allegheny Energy Supply
an Allegheny Energy company

Legend

- Noise Receptor Location
- Project Area Boundary
- Generating Facility Site
- Well Field
- Proposed Switchyard
- Township and Range Lines
- 26 Section Lines and Numbers
- County Boundary
- Interstate Highway
- Central Arizona Project Canal
- Centennial Wash
- Proposed Gas Pipeline
- EPNG Pipeline
- Proposed 500kV Transmission Line
- Palo Verde-Devers 500kV Transmission Line

Source:
USGS, Little Horn Mountains 30x60 Minute Quad, Revised 1988.
USGS, Salome 30x60 Minute Quad, Revised 1984.

level to simulate the average height of the human ear. The sound level meter was calibrated before and after the measurement period.

The measurement results are summarized in Table I-2 and correspond to the measurement locations ML1 and ML2 shown on Figure I-1. Sound levels measured at ML1 consisted of 1-hour measurements conducted during the day and evening periods. The primary noise source at ML1 and ML2 were from distant vehicular traffic on Interstate 10. Hourly sound levels ranged from approximately 54 dBA to 58 dBA at ML1 (closest residence) and measured approximately 61 dBA at ML2 (proposed generating facility site).

Environmental Consequences

Noise would be produced at the site during construction and operation. Potential noise impacts from both activities are assessed in this section. In addition, potential noise impacts from construction upgrades to Avenue 75E. For the purposes of this analysis, significance criteria were used to determine the magnitude of the noise impacts. Impacts would be considered adverse if either of the following statements were true:

- Project-generated operation noise would result in a substantial noise level increase at noise-sensitive locations. For the purposes of this analysis, an increase of ambient noise levels of 5 dBA is considered to be adverse.

- Project-generated operation noise would result in a noise level exceeding the HUD recommendation of 65 dBA L_{dn} at any residence.

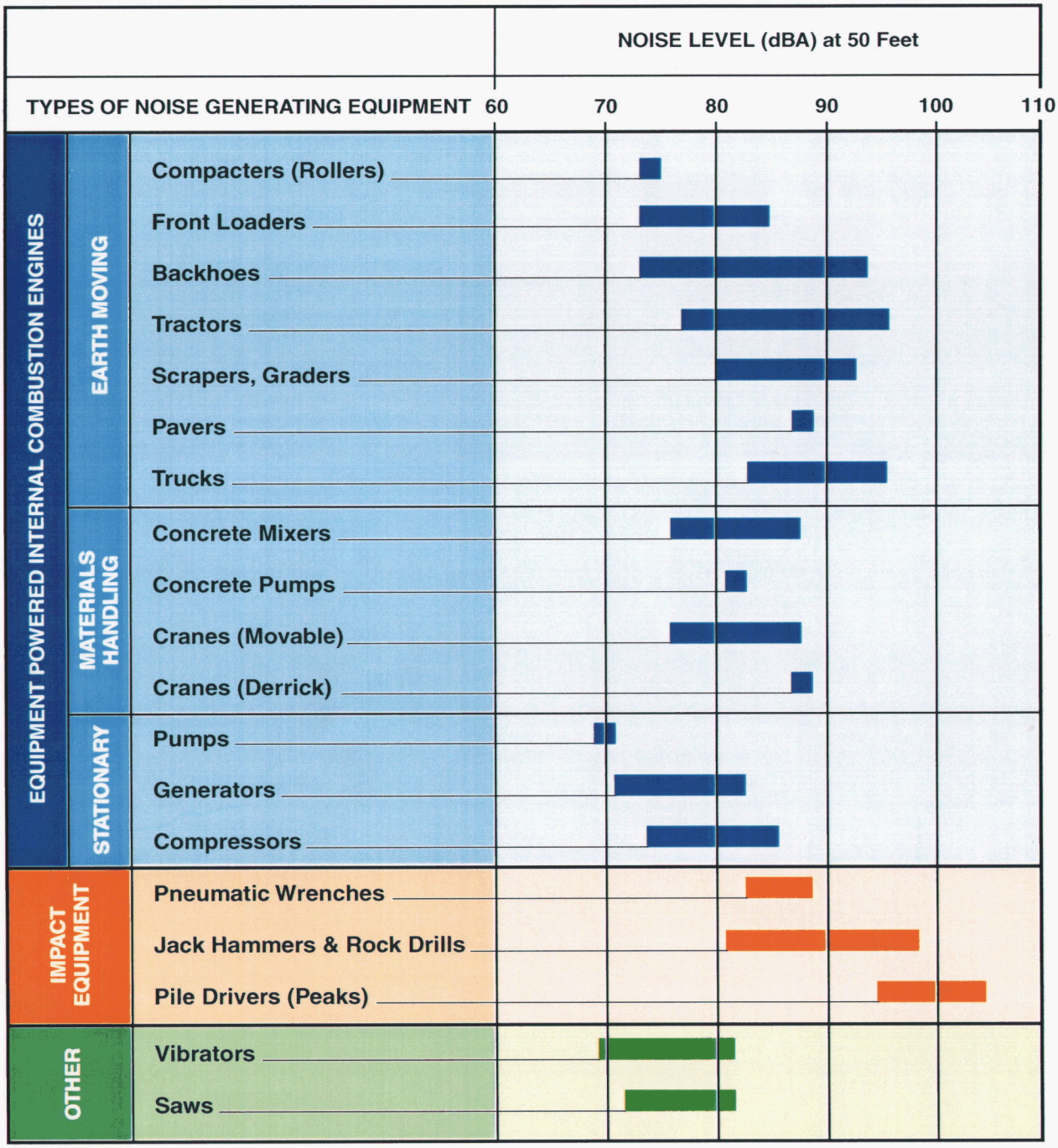
Construction Impacts

Project construction would result in a short-term temporary increase in the ambient noise level. Noise would result from the operation of construction equipment. The increased noise level would be primarily experienced close to the noise source. The magnitude of the impact would depend on the type of construction activity, the noise level generated by various pieces of construction equipment, the duration of the construction phase, and the distance between the noise source and receiver. Figure I-2 shows average noise levels generated by individual pieces of construction equipment. Sound levels will typically range from 85 dBA to 90 dBA at 50 feet from the source (EPA 1971). Based on this range of values, the sound level would be approximately 41 dBA to 46 dBA at the closest residence (ML1). This assumes noise attenuation at a rate of 6 dBA per doubling of distance from the source plus. Sound levels at the closest receptors would be below the measured ambient noise level and therefore would not result in a significant noise impact.

During final construction, a method used to clean piping and testing called "steam blows" creates substantial noise. A steam blow results when high-pressure steam is allowed to escape into the atmosphere through the steam piping to clean to clean it. A series of short steam blows, lasting two or three minutes each, would be performed several times daily over a period of two or three weeks. Steam blows are necessary after erection and assembly of the feedwater and steam systems because the piping and tubing that comprises the steam path accumulates dirt, rust, scale, and construction debris. The steam blows prevent debris from entering the steam turbine.

Steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. The resultant sound level at the closest receptor would be 92 dBA. To minimize these short-term, temporary noise impacts, the piping would be equipped with a silencer that would reduce noise levels by 20 to 30 dBA.

Typical Construction Equipment Noise Generation Levels



URS

Figure I-2

Operations Impacts

The proposed facility would be a natural gas-fired, combined-cycle electric generating facility. There would be two power blocks, each consisting of two CTGs, two HRSGs, and one reheat condensing steam turbine equipped with a steam turbine, condenser, transformers, associated auxiliaries and cooling towers. The overall noise level generated by these components would depend upon the physical layout of the facility and the mitigation measures incorporated into the facility design. Onsite sound levels may be as high as 100 dBA depending on the proximity to the noise source.

Acoustical calculations were performed to estimate noise levels that would be generated by major noise producing components at the closest noise sensitive receptor. Source sound levels are based on estimated plant sound levels presented in Tables I-3 through I-7. The calculations assumed that all noise-generating equipment would be located at one point on site as opposed to the spatial distribution identified on the site plan (Figure I-1) because by concentrating the noise source emissions, the analysis is representative of a worst-case condition. The cumulative (combined) steady state sound level from each of the components in Tables I-3 through I-7 was calculated to be 76.4 dBA at 400 feet. Point source acoustical characteristics were then applied to project the noise to the receptors. A point source decays sound from a source to a receiver at a rate of 6 dB per doubling of distance from the source-receiver pair. This is a logarithmic relationship describing the acoustical spreading of a pure undisturbed spherical wave in air. The effects of directionality, atmospheric absorption, ground attenuation, and intervening topography and off site structures that may further reduce propagated noise levels, were not considered due to many uncertainties. Therefore, the attenuation rate was considered to be:

$$20 \, \mathrm{Log}_{10} \, (r/r_{ref})$$

where r = distance, and r_{ref} = reference distance

Based on the above assumptions, the estimated sound level at the closest noise-sensitive receptor to the proposed power plant (ML1) would be approximately 50 dBA (56 dBA L_{dn}). The projected sound levels would less than the 65 dBA L_{dn} criteria recommended by HUD and would be less than the sound levels measured on June 1, 2001. No significant noise impacts were identified at any noise sensitive receptor.

Worker Effects

Occupational noise exposure of employees within the plant cannot be evaluated until the project has been constructed and employee jobs and routines determined. At that time, a noise evaluation will be conducted to ensure that employees are adequately protected in accordance with OSHA requirements.

Mitigation Measures

No adverse noise impacts were identified; therefore, no mitigation is required.

Conclusions

The proposed project would not result in adverse noise impacts to sensitive receptors (e.g., residences and recreation areas) within the project area. Sound levels would be well under HUD recommendations. Sound levels created by operation of the generating facility (approximately 50 dBA) would be lower than those created by traffic on Interstate 10 (approximately 54 dBA to 58dBA) as heard from the nearest residence (ML1). Temporary construction noise and steam blows may exceed ambient noise levels for sensitive receptors, however they will be short-term and efforts will be taken to minimize the occurrences.

TABLE I-1
SOUND LEVELS OF TYPICAL NOISE SOURCES AND NOISE ENVIRONMENTS
(A-WEIGHTED SOUND LEVELS)

Noise Source (at Given Distance)	Scale of A-Weighted Sound Level in Decibels	Noise Environment	Human Judgment of Noise Loudness (Relative to a Reference Loudness of 70 Decibels*)
Military Jet Take-off with After-burner (50 ft)	140	Carrier Flight Deck	
Civil Defense Siren (100 ft)	130		
Commercial Jet Take-off (200 ft)	120		**Threshold of Pain** 32 times as loud
Pile Driver (50 ft)	110	Rock Music Concert	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Power Lawn Mower (3 ft)	100		**Very Loud** 8 times as loud
Motorcycle (25 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck, 40 mph (50 ft)	90	Boiler Room Printing Press Plant	4 times as loud
Garbage Disposal (3 ft)	80	High Urban Ambient Sound	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (3 ft) Electronic Typewriter (10 ft)	70		**Moderately Loud** 70 decibels (Reference Loudness)
Normal Conversation (5 ft) Air Conditioning Unit (100 ft)	60	Data Processing Center Department Store	1/2 as loud
Light Traffic (100 ft)	50	Private Business Office	1/4 as loud
Bird Calls (distant)	40	Lower Limit of Urban Ambient Sound	**Quiet** 1/8 as loud
Soft Whisper (5 ft)	30	Quiet Bedroom	
	20	Recording Studio	**Just Audible**
	10		**Threshold of Hearing**
	0		

Source: Compiled by URS Corporation

TABLE I-2
SOUND LEVEL MEASUREMENTS

Time	L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
ML1: Nearest Residence. SW corner property line, approximately 200 feet from the house.						
11:45 a.m. – 12:45 p.m	56.8	74.2	35.0	60.8	47.7	40.4
12:45 p.m. – 1:45 p.m	55.2	75.3	36.1	61.0	46.1	41.0
1:45 p.m. – 2:45 p.m	54.3	74.8	35.0	60.1	45.3	41.0
2:45 p.m. – 3:45 p.m	55.8	79.9	34.8	59.8	44.8	40.3
1:45 p.m. – 2:45 p.m	56.1	80.1	35.2	65.2	47.2	42.1
7:00 p.m. – 8:00 p.m	54.0	75.3	33.0	53.8	44.8	41.0
ML2: Northeast corner of proposed power plant						
2:25 p.m. – 3:25 p.m.	61.3	74.9	40.1	65.3	57.9	56.8

Notes:
Sound levels measured on June 1, 2001. Temperature 110 °F. Periodic wind gust.
All sound levels measured in dBA.
Primary noise sources were I-10 and wind gusts.

High wind speed prevented nighttime sound level measurements from being conducted.

TABLE I-3
STANDARD PACKAGED COMBUSTION TURBINE GENERATOR (SWP 501FD OR EQUIVALENT)

Noise emissions from the CTG package include the noise associated with the air inlet, the turbine compartment, the generator compartment, all compartment vent fans, the turbine exhaust ductwork, and all auxiliary components. Generally, the noise emissions include all equipment and auxiliary components included in the CTG manufacturers scope-of-supply.

OCTAVE BAND SOUND POWER LEVEL (LW), DB										**Overall Lw**	
Source Component	Octave Band Center Frequency, Hz										
	31.5	63	125	250	500	1K	2K	4K	8K	dBA	dB
CT Inlet	102	106	99	98	87	78	74	81	77	92	108
CT Compartment	108	110	105	103	100	98	104	99	94	108	114
GEN Compartment	102	102	101	98	100	99	98	93	84	104	109
COMP Vents	106	107	110	104	101	102	103	110	98	113	116
Exhaust Duct	123	119	115	113	109	104	102	97	94	111	125

Corresponding Equipment Sound Level Specifications	
Far-field	The combustion turbine generator package shall not exceed a maximum A-weighted sound pressure level (ref: 20 microPa) of 65 dBA at a distance of 400 feet in any direction from the equipment envelope and 5 feet above the ground in a free-field during normal operation of the equipment. Normal operation excludes start-up, shutdown, and all off-normal and emergency conditions.
Near-field	The combustion turbine generator package shall not exceed a spatially-averaged A-weighted sound pressure level (ref: 20 microPa) of 90 dBA along the equipment envelope at a height of 5 feet above the ground and all personnel platforms during normal operation. Normal operation excludes start-up, shutdown, and all off-normal and emergency conditions.

Notes:
Each noise source is considered a point source.
Source: Black & Veatch

TABLE I-4
STANDARD PACKAGED HEAT RECOVERY STEAM GENERATOR
(COMBINED CYCLE INSTALLATION WITH A SWP 501FD CTG)

Noise emissions from the HRSG package include the noise associated with the transition ductwork, the boiler section, the stack, and all associated equipment. Generally, the noise emissions include all equipment and auxiliary components included in the HRSG manufacturers scope-of-supply.

OCTAVE BAND SOUND POWER LEVEL (LW), DB										Overall Lw	
Source Component	Octave Band Center Frequency, Hz										
	31.5	63	125	250	500	1K	2K	4K	8K	dBA	dB
Transition Ductwork	116	122	118	111	101	100	86	68	40	107	124
Boiler Section	118	122	118	110	100	99	88	67	37	107	125
Stack Exit	118	126	128	125	116	115	102	77	58	120	132

Corresponding Equipment Sound Level Specifications	
Far-field	The heat recovery steam generator package shall not exceed a maximum A-weighted sound pressure level (ref: 20 microPa) of 67 dBA at a distance of 400 feet in any direction from the equipment envelope and 5 feet above the ground in a free-field during normal operation. Normal operation excludes start-up, shutdown, bypass, and all off-normal and emergency conditions.
Near-field	The heat recovery steam generator package shall not exceed a spatially-averaged A-weighted sound pressure level (ref: 20 microPa) of 90 dBA along the equipment envelope at a height of 5 feet above the ground and all personnel platforms during normal operation. Normal operation excludes start-up, shutdown, bypass, and all off-normal and emergency conditions.

Notes:

- Each noise source is considered a point source.
- The height of the transition ductwork point source is approximately 40 ft.
- The height of the boiler section point source is approximately 85 ft.
- The height of the stack exit point source is approximately 180 ft. Sound propagation of the stack exit point source should include the effect of vertical directivity.

Source: Black & Veatch

TABLE I-5
STANDARD PACKAGED STEAM TURBINE GENERATOR

Noise emissions from the STG package include the noise associated with the turbine compartments, the generator compartment, and all associated auxiliary equipment. Generally, the noise emissions include all equipment and auxiliary components included in the STG manufacturers scope-of-supply.

OCTAVE BAND SOUND POWER LEVEL (LW), DB										Overall Lw	
Source Component	Octave Band Center Frequency, Hz										
	31.5	63	125	250	500	1K	2K	4K	8K	dBA	dB
ST Package	115	121	119	114	110	106	103	95	89	112	124
Generator Package	115	121	119	114	110	106	103	95	89	112	124

Corresponding Equipment Sound Level Specifications	
Far-field	The steam turbine generator package shall not exceed a maximum A-weighted sound pressure level (ref: 20 microPa) of 65 dBA at a distance of 400 feet in any direction from the equipment envelope and 5 feet above the ground in a free-field during normal operation. Normal operation excludes start-up, shutdown, bypass, and all off-normal and emergency conditions.
Near-field	The steam turbine generator package shall not exceed a spatially-averaged A-weighted sound pressure level (ref: 20 microPa) of 90 dBA along the equipment envelope at a height of 5 feet above the ground and all personnel platforms during normal operation. Normal operation excludes start-up, shutdown, bypass, and all off-normal and emergency conditions.

Notes:
Each noise source is considered a point source.
Source: Black & Veatch

TABLE I-6
STANDARD GENERATOR STEP-UP TRANSFORMER

Noise emissions from each GSUT package include the noise associated with the GSUT operating at maximum cooling capacity, i.e. with all cooling fans operating at full load.

OCTAVE BAND SOUND POWER LEVEL (LW), DB										Overall Lw	
Source Component	Octave Band Center Frequency, Hz										
	31.5	63	125	250	500	1K	2K	4K	8K	dBA	dB
GSUT	102	108	110	105	105	99	94	89	82	105	114

Corresponding Equipment Sound Level Specifications	
Specification	The generator step-up transformer shall not exceed a maximum A-weighted sound pressure level (ref: 20 microPa) of 85 dBA as measured in accordance with ANSI/IEEE C57.12.90.

Notes:
- Each noise source is considered a point source.
- The height of each GSUT point source is approximately 16 ft.

Source: Black & Veatch

TABLE I-7
STANDARD PACKAGED COOLING TOWER
(9-CELL MECHANICAL-DRAFT TOWER)

Noise emissions from the CLGTWR package include the noise associated with the fans (including the fan motors and gearboxes), water splash, and all associated auxiliary equipment. Generally, the noise emissions include all equipment and auxiliary components included in the supplier's scope-of-supply.

OCTAVE BAND SOUND POWER LEVEL (LW), DB										Overall Lw	
Source Component	Octave Band Center Frequency, Hz										
	31.5	63	125	250	500	1K	2K	4K	8K	dBA	dB
1-Cell	110	113	113	110	107	104	101	99	96	110	118
Corresponding Equipment Sound Level Specifications											
Far-field	The CLGTWR package shall not exceed a maximum A-weighted sound pressure level (ref: 20 microPa) of 67 dBA at a distance of 400 feet in any direction from the equipment envelope and 5 feet above the ground in a free-field during normal operation. Normal operation excludes start-up, shutdown, and all off-normal and emergency conditions.										
Near-field	The CLGTWR package shall not exceed a spatially-averaged A-weighted sound pressure level (ref: 20 microPa) of 90 dBA along the equipment envelope at a height of 5 feet above the ground during normal operation. Normal operation excludes start-up, shutdown, bypass, and all off-normal and emergency conditions.										

Notes:
Each noise source is considered a point source.
Source: Black & Veatch

ELECTRICAL EFFECTS

The electrical effects of the proposed 500kV transmission line interconnection and switchyard are those associated with electric field, magnetic field, and corona. Electric and magnetic fields result in induced voltage on objects near the facilities. Corona effects are manifested in audible noise (AN), radio interference (RI), and television interference (TVI). The effects will be minimized by location, design, and construction practices associated with the 500kV transmission line interconnection and switchyard.

CORONA

Corona is a partial electrical breakdown that results in the transformation of energy into very small amounts of light, sound, radio noise, chemical reaction, and heat. Corona results when the voltage gradient surrounding energized conductors or hardware exceeds the breakdown strength of air, resulting in electrical discharges. Corona is a recognized phenomenon, and it is considered in the design of electrical hardware and equipment. It is more severe during rainy or damp weather, when the breakdown strength of air is reduced.

500KV TRANSMISSION LINE INTERCONNECTION AND SWITCHYARD AUDIBLE NOISE

Transmission lines and substations can generate a small amount of sound energy, which can translate into audible noise. Under normal weather conditions in Arizona, this can barely be heard. During rainy or very moist conditions, drops of water can form on the conductors, resulting in increased corona activity when a crackling or humming sound can be heard near the line. The noise decreases with distance from the line.

Due to the low audible noise level, the relatively few hours of audible noise producing weather, and location of the line with respect to neighboring residences and other land uses, no adverse noise conditions are anticipated for the proposed 500kV transmission line interconnection and switchyard. The proposed 500kV transmission line interconnection will not have any effect on audible noise on the Palo Verde-Devers 500kV transmission line.

RADIO AND TELEVISION INTERFERENCE

Overhead transmission lines and switchyards generally do not interfere with normal radio and television reception. Corona and gap discharges, however, are two potential sources of interference. Corona, as described above, may affect AM radios.

Gap discharges result from electrical discharges between broken or poorly fitting hardware, such as insulators, clamps, and brackets. The hardware is designed to prevent gap discharges; however, mechanical damage due to wind induced (aeolian) vibration, corrosion, gunshot, or other causes may create a condition where gap discharges can occur. Gaps between contact points on hardware, at which small electrical discharges can occur, are created. This phenomenon can be found on lines of all voltages, and sometimes occurs when "slack" or low tension spans result in insufficient tension to keep hardware firmly in contact. The discharge across the small gap acts as a low power electrical transmitter and may interfere with some radio and television signals. The stronger the transmitted signals, the higher the quality of the radio or television and its antenna system, and the farther the radio or television is from the gap source, the less it is affected by the gap discharge. Sources of gap discharge are not difficult to locate and can be repaired should they occur. A much more likely source of radio and television interference arises through electrical equipment in the home itself. The line voltage and the distance of prospective line routes from residences minimize the likelihood of objectionable audible noise, radio interference, or television interference from the line. Should it occur, Allegheny will record and investigate any complaints of radio and television interference reported, and take corrective action when necessary.

Adverse impacts due to interference with radio and television signals resulting from corona is not expected to occur as a result of the proposed project.

ELECTRIC AND MAGNETIC INDUCTION

Electric induction is the capacitive coupling of a voltage onto insulated objects near the transmission line or switchyard. The induced voltage is a function of line voltage, insulation, object dimensions, and distance from potentially affected objects. This voltage produces a short circuit when an insulated object is grounded.

The magnitude of the short circuit current is dependent upon the open circuit voltage, resistance of the object to ground, and the impedance of the grounding object. The discharge of this voltage creates an arc similar to that generated by static electricity obtained by a person walking across nylon carpeting.

Magnetic induction is a result of a current in a conductor coupling voltage into a parallel circuit. The maximum induced voltage occurs when the two circuits are parallel and reduces to a minimum when perpendicular. The parallel circuits may be other transmission lines, communication circuits, fences, etc. The induced voltage is a function of the line current, distance from the line and height of the conductors.

Successful operations of 500kV transmission lines and switchyards has demonstrated that, with normal grounding procedures, no harmful effects will be encountered from electrical or magnetic induction. Additionally, the closest developed site to the 500kV transmission line and switchyard would be

approximately 0.25 mile. At this distance, effects due to electrical or magnetic induction are highly unlikely.

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U.S. Environmental Protection Agency (EPA). 1972. *Construction Equipment Noise.*

EXHIBIT J—SPECIAL FACTORS

EXHIBIT J – SPECIAL FACTORS

As required by A.A.C. R14-3-219 Applicant provides the following information:

Describe any special factors not previously covered herein, which applicant believes to be relevant to an informed decision on its application.

ECONOMIC STUDY OF LA PAZ COUNTY

Arizona State University has performed an economic study on the proposed generating facility, which is included as Exhibit J-1.

COMMUNITY INVOLVEMENT IN THE ENVIRONMENTAL STUDY AND SITING PROCESS

A comprehensive agency and pubic participation program was established and implemented to facilitate the environmental studies and permitting process. The intent of the program was to encourage interaction among the project team, agencies, and public both to keep the agencies and public informed about the project and to solicit information in a manner that assists in preparation of the environmental studies and the permitting process.

The program has consisted of the following components.

- development of project fact sheets (English and Spanish versions)
- agency and stakeholder meetings
- public open house meetings
- press releases, media interviews, and meeting notifications
- organization of a Citizens Advisory Panel (CAP)
- meetings with the CAP

Specific information relative to the agency and public participation program is contained in Exhibits J-2 and J-3. This program will continue to function throughout the life of the project.

EXHIBIT J-1—ECONOMICS

ECONOMIC AND FISCAL IMPACT OF ALLEGHENY ENERGY'S LA PAZ GENERATING FACILITY

June 2001

Prepared by
Center for Business Research
L. William Seidman Research Institute
College of Business
Arizona State University
Tempe, AZ 85287-4011

ECONOMIC AND FISCAL IMPACT OF ALLEGHENY ENERGY'S LA PAZ GENERATING FACILITY

SUMMARY

Allegheny Energy has proposed to build a $450 million electric generating facility to be located in La Paz County, about 70 miles west of Phoenix, Arizona. The plant will have a capacity of 1,080 megawatts and will generate some 8,500 gigawatt hours of electricity per year, enough to meet the energy needs of 600,000 Southwest households.

On-site construction is scheduled to begin in mid 2002 and will last for approximately 30 months. During this time, plant construction will have an annualized direct impact on spending in the state of Arizona of $48 million and an indirect impact of $38 million. This spending will serve to create 860 in-state jobs and earnings paid to Arizona households of some $31 million. Approximately one-half of these impacts will be felt in La Paz County.

Plant construction will provide significant tax revenues for Arizona's state and local governments. Construction sales taxes will total $2.6 million over the entire period of construction. Indirect income, sales, and property taxes on Arizona households and businesses will total $2.9 million.

Electric generation is a highly capital-intensive activity, so the direct impact of plant operations on Arizona employment and earnings will be relatively modest. The plant will employ 40 people on a full-time basis, with an annual payroll of $3 million. However, an additional 760 jobs and $28 million in earnings will be generated indirectly through the purchases of materials and services for plant operations, purchases of goods and services by plant employees and, most importantly, the spending of tax revenues collected by state and local governments. About 20 percent of the total new earnings in the state will be associated with jobs located in La Paz County.

The fiscal impact of plant operations will be substantial. The plant will be gas-fired and will use approximately $200 million worth of natural gas each year. These fuel purchases will be subject to the state's sales tax and will yield $10.1 million in tax revenues each year. Income from plant operations will be subject to the state corporate income tax. Income tax revenues are estimated to be $3.7 million per year. The plant also will contribute $2.7 million per year in property tax revenues. Finally, indirect income, sales, and property taxes raised through the multiplier process will add another $1 million to revenues. Total (direct and indirect) state and local tax revenues associated with plant operations will be $17.5 million per year.

ECONOMIC AND DEMOGRAPHIC PROFILE OF LA PAZ COUNTY

The La Paz Generating Facility will be located near I-10, just west of the La Paz-Maricopa County line and approximately 75 miles west of Phoenix. La Paz is a sparsely populated county with some 20,000 residents and a land area of 4,500 square miles (see Table J-1.1 for selected economic and demographic statistics). According to the latest census, the county population grew rapidly over the past 10 years. The La Paz population increased 42 percent from 1990-2000, about the same rate as the state as a whole.

TABLE J-1.1 ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF LA PAZ COUNTY		
	La Paz County	State of Arizona
Population, 2000	19,715	5,130,632
Percent change in population, 1990-2000	42.4	40.0
Persons per square mile	4.4	45.2
Personal income per capita, 1999	$22,100	$25,200
Earnings (by place of work) per capita	$10,900	$16,700
Adjustment for residence	$2,700	$100
Dividends, interest, and rent per capita	$3,200	$5,000
Transfer payments per capita	$5,300	$3,400

Source: Center for Business Research, L. William Seidman Research Institute, College of Business, Arizona State University, using data from the U.S. Bureau of the Census and the Bureau of Economic Analysis

Per capita income in La Paz County was $22,100 in 1999, 88 percent of Arizona per capita income. Per capita earnings, calculated by dividing earnings from jobs located in the county by the resident population, were only 65 percent of Arizona per capita earnings. Since many residents work outside the county, however, mean earnings by place of residence were somewhat higher, about $13,600 per resident, or 81 percent of mean earnings in the state. Also boosting per capita income in the county was the fact that residents received $5,300 per person in government transfer payments, $1,900 more than the statewide average. However, La Paz residents received $1,800 less per person in dividends, interest, and other capital income.

Table J-1.2 compares the industry composition of employment in La Paz County with that in the United States. The location quotients shown in column (4) of the table help to identify industries that form the economic base of the La Paz economy. Location quotients are calculated as the ratio of an industry's employment share in the local economy to its share nationwide. A location quotient greater than 1 indicates that local businesses are likely to receive a significant share of their income from residents outside the county.

The economic base of La Paz County derives from two primary activities — tourism and agriculture. Water recreational activities are available along a 17-mile strip in the Parker area. The town of Quartzite is known for its winter season gem and mineral shows. Substantial out-of-county income is also derived from those who pass through the county along I-10 and stop for food and gas.

The relative significance of tourism to the county is apparent from the employment figures in Table J-1.2. Amusement and recreation services account for 5.5 percent of total employment in the county, compared with only 1.0 percent in the nation. Auto dealers and service stations comprise 10.1 percent of La Paz County employment, but only 1.6 percent of U.S. employment. La Paz also has an above-average share of employment in eating and drinking establishments and in hotels and lodging places.

Agriculture is also an important export-base industry in La Paz County. Agriculture accounts for 13.8 percent of La Paz County employment, almost 5 times the national share. Particularly important to the county are agricultural services and businesses involved in the growing of hay and vegetables.

TABLE J-1.2 EMPLOYMENT BY INDUSTRY: LA PAZ COUNTY VS. UNITED STATES, 1998				
	LA PAZ COUNTY		UNITED STATES	Location Quotient
	Number of Employees (1)	Percent of Total (2)	Percent of Total (3)	Ratio of (2) to (3) (4)
Total	7,463	100.00	100.00	1.0
Agriculture	1,030	13.80	2.94	4.7
Hay and pasture	259	3.47	0.45	7.7
Vegetables	120	1.61	0.08	19.6
Agricultural services	533	7.14	0.42	16.9
Mining	7	0.09	0.43	0.2
Construction	366	4.91	6.57	0.7
Manufacturing	381	5.10	12.07	0.4
Transportation and public utilities	285	3.82	4.45	0.9
Wholesale and retail trade	1,963	26.30	20.89	1.3
Automotive dealers and service stations	755	10.11	1.62	6.2
Eating & drinking	492	6.60	5.19	1.3
Finance, insurance, and real estate	369	4.95	7.16	0.7
Services	1,821	24.40	30.54	0.8
Hotels and lodging places	231	3.09	1.24	2.5
Amusement and recreation services	413	5.53	0.97	5.7
Government	1,241	16.63	14.95	1.1

Source: Center for Business Research, L. William Seidman Research Institute, College of Business, Arizona State University, using 1998 IMPLAN employment data files, Minnesota IMPLAN Group.

ECONOMIC IMPACT OF LA PAZ GENERATING FACILITY

Estimates of the economic impact of the proposed generation plant were made using an Arizona-specific version of IMPLAN, an input-output model used widely by researchers throughout the United States. The input-output model provides estimates of the direct and indirect impacts of plant construction and plant operations on spending, employment and earnings in the local economy. Direct impacts refer to construction- or operations-related purchases of materials and services from local suppliers and to jobs directly connected to construction or plant operations. These direct impacts then induce indirect or multiplier effects when local suppliers place upstream demands on other producers, when employees spend their incomes in the community, and when state and local governments spend new tax revenues. The size of these multiplier effects depends on the percentage of purchases that falls on goods and services produced inside the local economy. The higher is the share of local production, and the smaller the propensity to import, the larger are the multiplier effects.

Economic impact assessments were made for two study areas—La Paz County and the state of Arizona. In estimating county-level impacts, the state model was modified to reflect the specific industrial structure of La Paz County. Because La Paz has such a narrow industrial base, the multiplier effects associated with spending and employment in the county tend to be small.

Construction-related Impacts

Table J-1.3 provides estimates of the economic impacts arising from construction of the Allegheny plant. Construction phase impacts are short-term effects related to construction employment and industries that support construction. On-site construction is scheduled for a 30-month period beginning in mid 2002 and ending late in 2004. This is the general time period during which the construction impacts will be felt.

TABLE J-1.3 ECONOMIC IMPACT OF LA PAZ GENERATING FACILITY: CONSTRUCTION*		
	La Paz County	State of Arizona
Spending (in millions of 2001 dollars)		
Direct	32.2	48.0
Indirect	6.3	37.9
Total	38.5	85.9
Employment (full-time equivalent jobs)		
Direct	300	365
Indirect	99	491
Total	399	856
Earnings (in millions of 2001 dollars)		
Direct	12.4	15.4
Indirect	2.4	15.9
Total	14.8	31.3

*Construction figures are at annualized rates. Construction-related impacts are temporary, corresponding to a projected 30-month construction period beginning in mid 2002.

Source: Center for Business Research, L. William Seidman Research Institute, College of Business, Arizona State University using data provided by Allegheny Energy and IMPLAN 2.0

The estimated cost of the plant is $450 million. The value of local construction costs, together with in-state purchases of equipment and materials, is estimated at $120 million, or $48 million on an annualized basis. Plant construction will directly create 365 jobs in the state. These workers will earn an average of $42,000, so the project will generate direct local earnings of $15 million per year during the construction period.

The indirect impacts from plant construction occur partly through interindustry relationships within the Arizona economy. Each $1 of construction spending in the state induces $0.35 of additional spending when suppliers purchase goods and services from other Arizona businesses. Most of these induced effects are concentrated in wholesale trade, professional services and other business services. Another way in which plant construction indirectly affects the state economy is when the workers involved, those employed directly and those working for suppliers, spend some of their earnings on locally-produced goods and services. Each $1 of construction spending is estimated to induce an additional $0.44 worth of spending because of the consumer spending of involved workers. The industries affected by this spending are largely retail trade and consumer service industries. Accounting for all induced effects, plant construction is estimated to have an indirect impact on Arizona spending of $38 million per year. This spending will generate an additional 490 jobs and $16 million worth of earnings in the state economy.

Construction of the La Paz facility will have a total (direct plus indirect) annualized impact of $86 million on spending in the state of Arizona. This spending will generate a total of 860 in-state jobs and earnings equal to $31 million per year.

To estimate the economic impact of plant construction on La Paz County, it was assumed that (i) use of county suppliers during the plant's construction would follow the patterns typical of new utility construction in the county (relationships already captured in the IMPLAN model); (ii) one-quarter of the on-site construction crew would live in La Paz County; and (iii) none of the specialized mechanical or electrical equipment would be purchased from suppliers in the county. Under these assumptions, direct spending in the county will equal $32 million at an annualized rate. Indirect spending associated with interindustry purchases and local spending by the construction crew will equal $6 million per year. Thus the total spending impact on the county is estimated to be $39 million per year. Average on-site construction employment is

expected to be around 300 workers. An additional 100 jobs may be generated through the multiplier process. The total employment impact on the county is then 400 jobs. Direct earnings associated with construction are estimated at $12 million, and an additional $2 million will arise through the multiplier process. The total impact of construction on La Paz county earnings is $15 million per year.

Operations-related Impacts

Electric generation is a highly capital-intensive activity. The value of fixed assets per worker in the nation's electric and gas utilities is $1.3 million. This is 13 times the capital per worker used on average across all U.S. industries. Because of these high capital requirements, electric generation yields significant revenues for state and local governments through property taxes and corporate income taxes. The impacts of plant operations on local employment and earnings, however, are relatively small. Table J-1.4 shows our estimates of the economic impacts arising from operations at the Allegheny plant.

TABLE J-1.4
ECONOMIC IMPACT OF LA PAZ GENERATING FACILITY: OPERATIONS

	La Paz County	State of Arizona
Spending (in millions of 2001 dollars)		
Direct	25.4	25.4
Indirect	2.1	43.9
Total	27.5	69.3
Employment (full-time equivalent jobs)		
Direct	40	40
Indirect	33	763
Total	73	803
Earnings (in millions of 2001 dollars)		
Direct	3.0	3.0
Indirect	3.5	27.5
Total	6.5	30.5

Source: Center for Business Research, L. William Seidman Research Institute, College of Business, Arizona State University using data provided by Allegheny Energy and IMPLAN 2.0

Commercial operations at the plant are scheduled to begin in December 2004. There will be approximately 40 full-time positions at the plant. Average pay, including salary and benefits, will be $75,000 per worker, with a total payroll of $3 million per year. In addition to the payroll expenses, the plant will spend $22 million per year on locally produced materials and services, including maintenance contracts, chemicals, and consumables.

Through the multiplier process, direct spending of $25 million generates indirect spending in the state economy of $44 million. Each $1 of direct spending on plant operations gives rise to $0.54 of spending by state and local governments, expenditures financed from sales and income taxes on Allegheny operations. For every $1 of direct spending, $0.37 also is spent when suppliers purchase goods and services from other Arizona businesses. Finally, another round of economic impacts is triggered when all of the workers involved, both directly and indirectly, spend a portion of their incomes in the state economy. Each $1 of direct spending on Allegheny operations is estimated to induce an additional $.82 worth of spending because of the consumer spending of involved workers. Accounting for all induced effects, plant operations have an indirect impact on spending in Arizona of $44 million per year. This spending, in turn, will generate 760 jobs and $28 million worth of earnings. The total (direct plus indirect)

impacts of plant operations are $69 million in spending, 800 full-time equivalent jobs and $31 million in earnings per year.

To estimate the impact of plant operations on the La Paz County economy, we assumed that (i) three-quarters of the full-time personnel would choose to live in La Paz; (ii) the county would receive none of the interindustry effects associated with plant purchases of materials and services; and (iii) the county would use Allegheny property tax revenues to reduce property tax rates (see next section). Under these assumptions, multiplier effects add an additional $2.1 million of spending to the La Paz economy and support an additional 33 jobs and $3.5 million of after-tax earnings. The total impacts of plant operations on the La Paz economy are $27.5 million in spending, 73 jobs, and $6.5 million in earnings per year.

FISCAL IMPACT OF LA PAZ GENERATING FACILITY

The La Paz plant will generate substantial tax revenues for Arizona. Annual fuel consumption of 45 million MMBtu of natural gas will be subject to sales/use taxes. Also, because the plant is so highly capital intensive, it will generate state income and local property tax revenues far out of proportion to its employment. For the average Arizona business, tax collections from sales, property, and income taxes amount to about $1,500 per worker. Taxes associated with the operations of Allegheny's La Paz facility are on the order of $400,000 per worker. A summary of the plant's fiscal impacts is provided in Table J-1.5.

TABLE J-1.5
FISCAL IMPACT OF LA PAZ GENERATING FACILITY
(IN MILLIONS OF 2001 DOLLARS)

Type of Tax	Tax Revenue
Construction-related impacts*	
Construction sales tax	1.0
Indirect taxes on AZ households	0.9
Indirect taxes on AZ businesses	0.3
Total state & local taxes	2.2
Operations-related impacts	
Allegheny fuel use taxes	10.1
Allegheny corporate income taxes	3.7
Allegheny property taxes**	2.7
Indirect taxes on AZ households	0.7
Indirect taxes on AZ businesses	0.3
Total state & local taxes	17.5

*Construction figures are at annualized rates. Construction-related impacts are temporary, corresponding to a projected 30-month construction period beginning mid 2002.

**Estimate for tax year 2007, the first year in which full commercial operations are recognized.

Source: Center for Business Research, L. William Seidman Research Institute, College of Business, Arizona State University using IMPLAN 2.0 and data from Allegheny Energy, B&G Property Tax Associates, and the Utah State Tax Commission.

Construction Sales Tax

The state levies a sales tax on materials used in plant construction. The tax is calculated assuming that 65 percent of construction cost is related to materials, with the remaining 35 percent assumed to be labor costs. The sales tax is applied only to the materials portion of the project. Taxable materials are estimated to be $52 million. Sales tax revenues relating to construction then amount to $2.6 million, or $1.0 million at an annualized rate.

Fuel Use Tax

Natural gas consumption is taxed by the state at a rate of 5 percent of value. Allegheny projects that the plant will use on average 45 million MMBtu of gas per year over the 30-year life of the plant. Gas prices are currently in a neighborhood of $5 per MMBtu but are not expected to remain that high. In our tax estimates, we use a figure of $4.50 per MMBtu for average gas prices. This implies fuel consumption of $200 million per year and state tax revenues of $10.1 million per year. Revenues will fluctuate with gas prices. A deviation from mean of +/- $2 per MMBtu in gas prices implies a deviation of +/- $ 4.5 million in fuel tax revenues.

Corporate Income Tax

Given the size of the capital investment, it is expected that the Allegheny plant will generate significant tax revenues for the state through the corporate income tax. Allegheny has estimated that its state income tax payments will average $ 3.7 million per year.

Property Tax

Allegheny Energy assets located within Arizona will be subject to county and local school district property taxes. The plant will reside in an area inside the Wenden school district of La Paz County. Under state law, electric generation assets are assessed for tax purposes at 25 percent of their cash value.

Estimates of Allegheny's property taxes were prepared by B&G Property Tax Associates. Because Allegheny's assets are large relative to the La Paz tax base, B&G tried to allow for the impact of Allegheny on property tax rates within the county. In one scenario — the one used in our economic impact analysis — B&G held total tax revenues constant at their values in 2000 and assumed that new taxes from Allegheny would reduce the taxes of existing property owners dollar for dollar. The first tax year in which full commercial operations at the plant are recognized is 2007. Using the assessed values of Allegheny's assets in that year and the total assessed values in the county in tax year 2000, B&G estimated that Allegheny's property tax liability in 2007 would be $2.7 million. By assumption, almost all of this revenue is used to reduce taxes for existing property owners. The average primary tax rate for existing owners falls from $6.2306 per $100 of assessed value to $4.2402, and the average secondary rate decreases from $0.6953 to $0.4452.

Under current statutes, an infusion of taxable assets the size of Allegheny's will trigger a significant increase in the qualifying tax that Arizona uses to help equalize educational expenditures across the state. It is impossible to estimate the size of this rate with any degree of accuracy. However, using simplifying assumptions to make the analysis manageable, B&G estimated that the Allegheny plant could raise the qualifying rate by as much as $2 per $100 of assessed value. With the addition of this tax, Allegheny's property tax liability in 2007 would be $3.5 million rather than $2.7 million. The qualifying tax also would be applied to other property owners in the county. This would reduce the amount of tax relief realized by La Paz residents and would redirect some of the new tax monies from the county to the state.

In its analysis, B&G assumed that Allegheny would use accelerated depreciation methods when valuing equipment for tax purposes, as required by state law. An implication of this assumption is that the assessed value of Allegheny's property rises from $42 million in 2007 to $71 million in 2010 (due to the recapture of depreciation) before falling. Allegheny's property tax liabilities, therefore, will follow a similar temporal pattern.

Indirect Taxes

Indirect tax revenues will be generated in the state through the multiplier process. Estimates of these effects were made by combining IMPLAN estimates of the indirect earnings/value-added associated with plant construction and operations with estimates of the burden of Arizona's state and local taxes on households and businesses. For each $1,000 of income, households pay $20 in income taxes, $36 in general sales and excise taxes, and $14 in property taxes. For each $1,000 of value-added, businesses pay $4 in income taxes, $14 in sales taxes, and $11 in property taxes. Using these figures, we estimate that there will be an additional $1.1 million of indirect taxes collected because of plant construction and $1.0 million of indirect taxes related to plant operations.

Summary of Fiscal Impacts

The total of all construction-related revenue impacts over the entire construction period is $5.5 million. Taxes on construction materials account for 47 percent of this total. The remaining revenues come from income, sales, and property taxes collected from households and businesses involved through the multiplier process.

Tax collections associated with plant operations will be $17.5 million per year. Of this total, taxes on fuel consumption account for 58 percent, corporate income taxes for 21 percent, and taxes on Allegheny property for 15 percent.

CONCLUSION

The direct impact of Allegheny operations on jobs and incomes in Arizona will be modest — employment of 40 workers and earnings of some $3 million per year. However, the plant will use a large amount of natural gas that is taxable under the state's sales tax. Also, because the plant is so highly capital intensive, it will generate state income and local property tax revenues far out of proportion to its employment. For the average Arizona business, tax collections from sales, property, and income taxes amount to about $1,500 per worker. Taxes associated with the operations of Allegheny's La Paz facility are on the order of $400,000 per worker. When these tax monies are spent by governments, or used to reduce existing taxes and then spent by households, a significant number of new jobs are indirectly created. It is estimated that each job at the Allegheny plant will induce an additional 19 jobs somewhere in the state. All totaled, operations at the La Paz facility will generate 800 new jobs and earnings of $31 million for the state of Arizona.

REFERENCES

Allegheny Energy. Estimates of construction costs, including percentage of equipment and materials to bepurchased from out-of-state suppliers. Projected operational expenses, including payroll, materials and services, and fuel. Estimates of state of Arizona corporate income tax payments.

Arizona Department of Revenue, *2000 Annual Report.*

B&G Property Tax Associates. Estimates of La Paz County property taxes on the Allegheny plant.

IMPLAN Professional, Version 2.0. Used to estimate indirect (or multiplier) effects of spending events. Construction impacts assessed using IMPLAN Sector #50 ("New Utility Structures"). Operational impacts assessed using IMPLAN Sector #511 ("State and Local Utilities").

Utah State Tax Commission, Economic and Statistical Unit, *Business and Household Initial State and Local Tax Burdens, FY 1999-2000.*

EXHIBIT J-2—LETTERS OF SUPPORT

La Paz County Board of Supervisors

1108 Joshua Avenue
Parker, Arizona 85344

(520) 669-6115 TDD (520) 669-8400 Fax (520) 669-9709

Gene Fisher - District 1
Clifford Edey - District 2
Joyce Barker - District 3

Larry A. Layton - County Administrator
Donna J. Hale - Clerk of the Board

October 24, 2000

Mr. Donald R. Feenstra, Vice President, Projects Division
Allegheny Energy Supply
800 Cabin Hill Drive
Greensburg, Pennsylvania 15601

Dear Mr. Feenstra:

In my opening remarks last Wednesday at our Board worksession, I mentioned that we had been waiting a long time for the day when we could announce with assurance that La Paz County was going to be the site of your new generating facility. I also took the opportunity to introduce David Bevilacqua and Paul Kramer of Allegheny to the public assembled in our hearing room, and to convey what high caliber people they are. I wanted everyone to know how impressed we all have been with the professionalism, integrity, and caring attitude that your advance team has shown to us.

It became evident, however, upon meeting you, Janice Lantz, Jeannine Hammer and Bryan Moorhouse, that Allegheny's corporate culture demands quality from its team members. You and your staff have proven to us that David, Paul, and Patricia Clark, whom we met at an earlier meeting, are part of a group of individuals that possess the characteristics we strive to nurture in ourselves and we appreciate in others.

On behalf of the Board of Supervisors, I thank you for selecting La Paz County, I welcome you, and I look forward to working with you and all of the fine Allegheny Energy Supply folks who will be part of this project.

Please accept these pins for your team as a token of our new friendship.

Sincerely,

Joyce Barker

Joyce Barker
Supervisor

c: David Bevilacqua
Patricia Clark
Jeannine Hammer
Paul Kramer
Janice Lantz
Bryan Moorhouse

La Paz County Board of Supervisors

1108 Joshua Avenue
Parker, Arizona 85344

(520) 669-6115 TDD (520) 669-8400 Fax (520) 669-9709

Gene Fisher - District 1
Clifford Edey - District 2
Jay W. Howe - District 3

(Vacant) - County Administrator
Donna J. Hale - Clerk of the Board

March 23, 2001

Mr. Michael P. Morrell, President
Allegheny Energy Supply
10435 Downsville Pike
Hagerstown, MD 21740

Dear Mr. Morrell:

Congratulations on successfully acquiring the proposed power plant site in La Paz County. It is yet another critical milestone in this important project. We continue to be excited about the prospect of Allegheny being a part of our community.

Thank you for selecting La Paz County, and I look forward to working with you and all of the fine Allegheny Energy Supply staff members who will be part of this project.

Sincerely,

Jay W. Howe
Supervisor

Cc: David J. Bevilacqua
James P. Garlick
Kevin Geraghty

La Paz County Board of Supervisors

1108 Joshua Avenue
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Jay W. Howe - District 3

(Vacant) - County Administrator
Donna J. Hale - Clerk of the Board

March 13, 2001

Ms. Gail Acheson, Field Manager
Yuma Field Office
Bureau of Land Management
2555 East Gila Ridge Road
Yuma, AZ 85365-2240

RE: Allegheny Energy Supply Company, L.L.C. La Paz Generating Facility

Dear Ms. Acheson:

La Paz County fully supports the efforts of Allegheny Energy Supply to obtain the public lands situated in Section 1, Township 2 North, Range 11 West of the Gila & Salt River Meridian.

We understand that the land has been identified for disposal in the *Final Amendment and Environmental Assessment to the Lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan* dated February 2000. We agree with that designation and believe that conveyance to Allegheny, in accordance with your procedures, would further at least two important goals: First, it would provide Allegheny with a buffer zone for their planned La Paz Generating Facility that would prevent land use conflicts in the future. Secondly, it allows the Bureau of Land Management to implement its Resource Management Plan for these lands in a timely fashion and without extra cost to the agency, since it is Allegheny's intention to enter into a reimbursement agreement with BLM to cover the cost of NEPA compliance.

We wish to thank you and your staff for your assistance in this project. Siting of this new electric generating plant in La Paz County is of great importance to us. It is an exciting and very positive economic development tool.

If you need further information or require our assistance, please call.

Sincerely,

Gene Fisher, Chairman

Clifford Edey, Vice-Chairman

Jay W. Howe, Member

WENDEN-SALOME FLOOD RECOVERY COMMISSION

P.O. Box 455
Wenden, AZ 85357
Ex. Director: Geo. J. Saiter Ed.D
Phone: 1-520-859-3858
Fax: 1-520-859-3163
email: gjsaiter@tds.net

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Tres.
Jeanne Youell
Kelly Stacy
Cheryl Montijo
Rev. Frank Snyder

April 5, 2001
Mr. Kevin Geraghty
Regional Director, Western Division
Allegheny Energy Supply
4350 Northern Pike
Mouroeville, PA 15146

Re: Request for grant

Dear Kevin,

As you suggested during our conversation at the McMullen Valley Chamber of Commerce I am requesting a grant of $10,000. It is needed for administrative costs and fees related to the acquisition of land to relocate victims of the October 2000 floods in Wenden, Arizona.

Background:

October 22, 2000: Heavy rains in the upper McMullen Valley send floodwaters raging through the town of Wenden, Arizona.

October 27, 2000: Another downpour sends the second flood through the town of Wenden. Total flood damage is estimated at 12 million dollars. Approximately 100 homes are damaged, and some are completely destroyed.

February 5, 2001: A group of local citizens form the Wenden-Salome Flood Recovery Commission and hires George Saiter as executive director.

The stated goals of WSFRC are to attempt to locate resources to alleviate the unmet needs of victims of the flood and return the community to normalcy.

Activities:

We have interviewed seventy families or about 75% of the flood victims. This assessment is ongoing. The unrecovered flood losses of the families interviewed are estimated at nearly $400,000, after considering the funds received from FEMA, SBA, Insurances, and local fund drives.

We are serving as an advocate and spokesman for the needy families. I have written several letters of appeal to FEMA and insurance companies. Often there is a need to

explain letters that flood victims have received and give them advice. I have also appealed to Church World Services for funds.

Urgent need:

The County of La Paz is in the process of offering to buy out 27 properties in the most severely flood damaged area of Wenden. There are very few lots available in the town of Wenden for the relocation of these families. There is no available land on the outskirts of the town because the land is owned by the city of Phoenix. Phoenix purchased the land a number of years ago as a future water source. Our displaced population will probably migrate to other areas unless land can be made available for relocation.

WSFRC is concerned about the financial health of the community. Wenden Water Company could lose over 10% of its customer base. The loss would have a negative impact on the ability to repay bonds. The loss in population would also affect our local school system and businesses.

We have asked the City of Phoenix to grant us a parcel of land adjacent to the North West side of town to be used for relocation. This would allow the water company to serve the area and compensate for loss of customers in the flood area of town.

Request:

The response from Phoenix has been positive. While the land will be free there are a number of costs related to acquisition. We will need to develop a 501(c)3 corporation to receive, hold and distribute the land.

We request a grant of $10,000 to aid in the administrative costs and fees related to the development of a 501(c)3 corporation and the land transfer. The Arizona Association of Food Banks is functioning as our fiduciary sponsor until we can develop our own non-profit corporation. Therefore, <u>your grant would be tax exempt</u>.

Thank you for your consideration.

Sincerely,

Geo. J. Saiter

George J. Saiter Ed.D.
Executive Director

McMULLEN VALLEY CHAMBER OF COMMERCE
P.O. BOX 477 • SALOME, AZ 85348 • 520-859-3846
" WHERE • SHE • DANCED "
mcmullen@azoutback.com www.azoutback.com

April 17, 2001

Kevin Geraghty
Allegheny Energy Supply
800 Cabin Hill Dr.
Greensburg PA 15601

Dear Kevin:

We are currently accepting donations for the July 4th Fireworks 2001. We invite you to support this community event. Any amount no matter how small would be appreciated.

You will receive recognition in our press releases and on the posters we will distribute in June promoting the event.

Thank you for all the support you give to McMullen Valley.

Sincerely,

Pat Palmer

Pat Palmer

McMULLEN VALLEY CHAMBER OF COMMERCE

P.O. BOX 477 • SALOME, AZ 85348 • 520-859-3846

" WHERE • SHE • DANCED "

mcmullen@azoutback.com www.azoutback.com

May 8, 2001

Kevin Geraghty
Allegheny Energy Supply
800 Cabin Hill Dr.
Greensburg PA 15601

Dear Kevin:

Thank you very much for your contribution to the Fireworks 2001 fund. We've always received positive feedback on it. Everyone seems to really enjoy it and we all know that if adults don't like it – the children certainly do.

You are the second largest contributor to this event. We look forward to your being a valuable part of our community and we do appreciate you.

We would like you to be among the first to know that the Spring Mixer will be May 30th at 6 p.m. at Salome Heights Public Golf Course. The Chamber will again pay for ½ of the meal for two people – the Chamber member & a spouse or guest. A newsletter will be sent out within a few days with more details.

Again, thank you.

Sincerely

Pat Palmer

Pat Palmer, board member

EXHIBIT J-3—PUBLIC CONTACT

PUBLIC MEETING COMMENTS AND ATTENDEES

Allegheny held three public open house meetings for residents within La Paz County. The meetings were held in the month of June 2001 at Parker, Wenden, and Quartzsite, Arizona. The number of attendees were as follows:

- Parker-8 attendees
- Wenden-16 attendees
- Quartzsite-29 attendees

Several comments regarding the proposed generating facility were received during the public open house meetings. Overall, the comments were very informative and supportive of the proposed generating facility. The comments, issues, and concerns are summarized below:

- Several residents were interested in jobs for themselves and family members and wanted to know when construction would start.
- Some residents wanted to know what the specific economic benefits the project would bring to La Paz County.
- Residents were very interested in the environmental studies that were being conducted and who the permitting agencies were. Additionally, residents wanted to know how long the permitting process would take and if they could review information collected for the project. Residents commented on air emissions, water supply, and the appearance of the proposed generating facility in the landscape.
- Residents appreciated the opportunity to participate in the process and felt the materials presented at the public open house meetings were very informative and that Allegheny and its consultants were knowledgeable and helpful when helping the public understand the proposed generating facility.
- A few residents recommended ways of improving notification procedures for future public open house meetings including larger displays posted in communities, radio and television ads, and direct mailings.

Table J-3 includes numerous additional contacts that Allegheny has had with the public and agencies throughout the project.

EXHIBIT J-3 PUBLIC CONTACT	
6/24/00	Held various discussions with the County Business Development Director - Mary Dahl and the County Supervisors to introduce Allegheny Energy Supply and solicit feedback about the prospect of siting a generating facility in the region.
10/18/00	In advance of publicly announcing the La Paz Project, representatives of Allegheny met with Arizona environmental agencies, State Department of Commerce, and notified State Senators and Representatives form the region and an aide to the Governor.
10/18/00	Representatives of Allegheny attended a County Board of Supervisors work session to publicly announce the Project. This meeting was attended by Representative Jim Carruthers, the public and representatives of local news agencies. Several comments of support were received.
10/18/00	Press release announcing Allegheny Energy Supply's intent to develop the La Paz Project to various state and trade news agencies.
10/24/00	Received a letter from La Paz County District No.3 Supervisor Joyce Barker complimenting Allegheny on the high caliber of the people representing Allegheny and expressing the county's excitement about the project.
12/4/00	La Paz Board of Supervisors Meeting. The County Supervisors unanimously approved Board sponsorship of an application to the Arizona State Land Department for a right of way to the proposed plant site.
12/12/00	Attended the McMullen Valley Chamber of Commerce Meeting and gave an overview presentation of the project. Members of the Chamber of Commerce were in unanimous support of the project and were interested in potential business prospects, how to prepare their high school students to compete for jobs at the plant, and understanding how to avoid California like blackouts.
1/31/01	Became member of McMullen Valley Chamber of Commerce
4/15/01	Received congratulatory letter from Jay Howe, La Paz County District No.3 Supervisor, on becoming landowner within the county.
1/24/01	Meet with Cecil Buchta to discuss possibility of providing a backup generator for Wenden's water plant. Power is a problem in the area. Toured the flood damaged areas of Wenden
1/24/01	Met with Cheryl Montejo of the McMullen Valley Chamber of Commerce to discuss the plant status. She offers some ideas on how to contribute to the community. Tells of high unemployment and that affect on families.
1/3/01	La Paz County Rezoning Board Hearing. Received recommendation for approval of rezoning and special use permit to build power plant . Met with Mary Dahl, La Paz County Community Development Director, and Zoning Board members to discuss the project.
2/5/01	La Paz County Board of Supervisors Meeting. Allegheny received approval for rezoning and special use permit to build a power plant. Met with Mary Dahl and supervisors to discuss status of project.
2/27/01	Meet with BVZ, the EPC contractor building Reliant's Desert Basin plant, at Casa Grande to discuss plant design issues and labor availability.
2/27/01	Meet with Bob Smalling, of Zachry Construction Company to discuss employment situation in AZ with respect to merchant plants. Discussed ways to get employment from La Paz County, especially Wenden and Salome to the projects. Discussed training needs and employment center in Goodyear.
2/27/01	Meet with Mark Minter, AZ Builder's Alliance to discuss labor and contracting issues in Arizona.
2/28/01	Meet with Joe Standley (President of Phoenix Building & Trades Council, as well as Business Manager for Ironworkers) , Henry Olea(Business Manager - Pipefitters), Wylie Miller (Business Manager - Carpenters),Don Peterson (Business Manager - Insulators), to discuss labor availability and PLA possibilities
3/6/01	Allegheny and Ann Green Communications meets with Jay Howe, No.3 District Supervisor for project update and input on Community Advisory Panel (CAP) formation.

EXHIBIT J-3 PUBLIC CONTACT	
3/20/01	Meet with ADEQ to discuss Air Permit data collection status. Met with Prahbat Bhargava, Nancy Wrona and Donna Lucchese.
4/2/01	Meet with Jim Downing, of the Harcuvar Company, to discuss the CAP. Discuss impacts facility would have on county. Jim is interested in buying power from Allegheny Energy Supply when a contract with APS expires. Talked about generation facility valuation. Jim explains the tax impact that facility would have on school districts.
4/2/01	Meet with Ilene Wood of Outback Realty to discuss CAP membership. Talk about housing needs and real estate needs of construction personnel as well as operating personnel. County medical presence needs improvement.
4/2/01	Meet with several local residents at County Supervisor Jay Howe's residence to discuss CAP members from beyond Wenden and Salome.
4/3/01	Meet with Mary Dahl to discuss CAP membership.
4/3/01	Meet with Gene Fisher, La Paz County Chairman of the Board of Supervisors, and discuss CAP membership. Gene was impressed with the fact that the CAP is facilitated by a professional outside group and remains throughout the facility's existence.
4/3/01	Meet with Cliff Edey, La Paz County Supervisor. Cliff asks when can we get another facility going. Cliff suggests members for the CAP. Discussed La Paz financial situation and impact facility will have on the County.
4/3/01	Meet with Paul Marks to get ideas for CAP membership. Paul discusses his plans to develop a "basic skills" training facility for Wenden and Salome.
4/3/01	Meet with George Nault, La Paz County Assessor. George has heard of the CAP and would like to be a member. George owns a business in Bouse.
4/3/01	Meet with Cheryl Montejo, George Saiter and Norma Saiter. Discuss facility needs and CAP membership. Provide ZCC infornmation for possible employment at plants near Palo Verde. Discuss full time needs of facilities. Discuss on-going maintenance demands for all facilities and the need for trained personnel. Discuss medical, education and employment needs of the County.
4/5/01	Request for assistance received from George Saiter of WSFRC
4/5/01	Meet with ADWR and ADEQ to discuss alternate blowdown possibilities.
4/6/01	Met with BLM in Yuma to discuss a potential land swap. They were excited about the possibility of swapping some desert scrub, low resource value land for some property at Sears Point. The Sears Point property is highly valued as an archeological resource due to petroglyphs.
4/13/01	Contact George Saiter and let him know that we would contribute $10,000
4/13/01	Meet with Tim Hogan, ASU Economics Head, to discuss economic impact study for La Paz County.
4/19/01	Meet with Vidler to discuss recharge option and to schedule a meeting with Harquahala Irrigation District.
4/24/01	On the agenda for HVID meeting on May 16th.
4/27/01	Meet with Charles Burton in Harquahala Valley. Chuck is interested in gaining an easement across one of the water properties to show his properties to prospective buyers.. He is also interested in where the plant is with respect to his development. He is closer to PG&E's plant. Will see it more. Discussed land uses in the area. Wants improved power in the area. Plant is not blocking his developments views of the mountains, and does not feel it is an impact.
4/27/01	Meet with Geraldo Cruz at Mr. Cruz' restaurant. Begin discussing how plant works and what it takes to build it. He is interested in getting some business from the projects. We discuss where labor comes from, and how much will be required.
4/30/01	Issue check for $500 to the McMullen Valley COC for the July 4th fireworks show.

EXHIBIT J-3 PUBLIC CONTACT	
5/1/01	Met with George Saiter and Cecil Buchta in Wenden. We discussed the Weden Salome Flood Commission's efforts and needs to date. We discussed media coverage for the check presentation. George and Cecil want some publicity for the flood recovery because they feel it has dropped from the public's eye. We also discussed Wenden's need for a backup Generator for the water plant. Discussed deregulation concepts.
5/1/01	Met with Mary Dahl. Discussed project status. Reviewed information I gathered from a tax valuation meeting I had attended in Phoenix the previous week. She said to discuss with George Nault. Discussed problems in California.
5/1/01	Met with George Nault of La Paz County Assessor's office. Retrieved records to review ownership on ROW requests.
5/7/01	Met with Earlene Warren and Don Wiechens of the Harquahala Valley Irrigation District. We stopped by to reaffirm that we were on the agenda of the HVID May 16th meeting - we were. We discussed the project and both Don and Earlene were pleased that we actually own the property in the HVID - not just simply having an option on it. We discussed land management issues, and both Don and Earlene were supportive of Allegheny's plans to continue farming the properties. They both expressed the Valley's reliance on farming as a way of life. We discussed charitable activities for the children in the valley that Don takes great interest in. Allegheny looks forward to helping out with future activities.
5/7/01	Met with Don Klump a local Farmer who had some questions about the project. Don moved down from Wikieup and had sold some property to the Big Sandy project developers.
5/7/01	The first Allegheny Energy Supply La Paz Community Advisory Panel meeting held at the Wenden Elementary School. Well attended - approximately 22 of the 25 members were present, and an additional 8 guests also came. The first meeting was an introduction to the CAP process and how Allegheny works towards developing strong CAPs at all of its generating facilities. The members asked many questions about the facility and were generally excited about the new addition to the community. Public meetings were discussed, and 4 locations and potential days were discussed with the community. Allegheny desires to introduce the project to the entire community through these community open houses.
5/7/01	Met with Guillermo Palmer, Wenden Volunteer Fire Company Chief to discuss the plant's operations. We will set up a joint meeting with the Salome VFD to discuss the needs of the departments.
5/8/01	Presented a $10,000 check to the Wenden-Salome Flood Recovery Commission. George Saiter provided a tour of the still affected areas.
5/8/01	Allegheny was invited and attended the McMullen Valley Chamber of Commerce meeting to discuss the plant.
5/10/01	Met with Jack and Jane Matkinson to discuss the project. Jack is a heavy equipment mechanic who works on large projects and would like to be involved with the development and operation of the La Paz project.
5/10/01	Met with "Scottie" Gallion of the Arizona Western Community College. Scottie wanted to discuss workforce training needs and possible curriculum development. Scottie brought me as a guest to the Parker Rotary Club meeting and provided a tour of Parker.
5/16/01	Met with the Harquahala Valley Irrigation District (HVID) board at the Estrella Mountain Community College. Introduced the project and answered several questions. The board invited us back for the June meeting and requested information on the water use for the project.
5/23/01	Met with local water treatment company to discuss water treatment options for the project.
5/24/01	Met with Scotty Gallon of the Arizona Western College to further discuss project and explore opportunities for training and education. Invited to join the apprentice task force for the joint Mohave and La Paz county effort
5/24/01	Met with the Parker Rotary club to discuss the project. Received many questions, mostly along the lines of employment opportunities.
5/25/01	Became member of the Quartzsite Chamber of Commerce.

EXHIBIT J-3 PUBLIC CONTACT	
5/25/01	Became member of the Parker Chamber of Commerce.
5/30/01	Met with a local mechanical contractor to discuss project needs and Arizona labor capabilities.
5/30/01	Met with Jim Downing to discuss further the possibilities of serving the load of the McMullen Valley Irrigation District.
5/30/01	Met with First Solar on possibilities for a solar project associated with the La Paz Generating Facility.
6/4/01	Had discussion with Dick Kurtz of AEPCO concerning possibility of serving some load requirements in future years.
6/6/01	Attended the Mohave/La Paz County Apprenticeship program development Board in Bullhead City. Discussed the needs to develop more trades. Other parties reciognized the growth limitations with existing workforces based on recent projects.
6/6/01	Gave a presentation on the project to High School seniors at the Arizona Western College in Parker. Discussed carreers in the power industry and the positive impacts on the workforce locally.
6/11/01	Held a Project Open House meeting for the public at the Arizona Western College Vocational training complex in Parker. Most attendees questions were with respect to jobs and job creation.
6/12/01	Held a Project Open House meeting for the public at the Wenden Elementary school in Wenden. No negative comments; several residents wanted to know how to get employment related to the project.
6/19/01	Held a Project Open House meeting for the public at the Quartzsite Town Hall in Quartzsite. No negative comments; several residents wanted to know how to get employment related to the project.
6/19/01	Met with members of the McMullen Valley Power District to discuss serving future bulk power needs.

CITIZENS ADVISORY PANEL (CAP) MEETING MINUTES

Minutes
Allegheny Energy Supply – LaPaz CAP
May 7, 2001

Attendees:	Rev. Wayne Arrington, Jeff Bohlen, Roger Crossman, George Davis, Jim Downing, Cathy Egolf, Trent Freedman, Scotty Gallan, Jack Glenn, Jay Howe, Lisa Krueger, Tennye Luper-Johnson, Cheryl Montijo, George Nault, Tom Overman, Guillermo Palma, Gina Rauber, Rev. Lester Ray, George Saiter, Illene Wood.
Industry Representatives:	Kevin Geraghty, Allegheny Energy Supply.
Guests:	Lillian Steele, Jack Martinson, Cheryl Howe.
Facilitator:	Mary A. Lovejoy, Ann Green Communications, Inc.
Minutes:	Mary Lovejoy.

The organizational meeting of the Allegheny Energy Supply – LaPaz Community Advisory Panel (CAP) was called to order by facilitator Mary Lovejoy May 7, 2001, beginning at 6:07 p.m. Mary welcomed everyone and said the evening's meeting would focus on introducing the panel concept, Allegheny Energy Supply and getting organized as a group. She said future meetings would focus on details of the project; but because of time, tonight's discussions would be more general.

Mary asked everyone to introduce themselves. Handouts and the evening's agenda were reviewed.

Introduction to CAPs

Mary said community advisory panels are an outgrowth of the chemical industry's desire to establish ongoing dialogue with its community. There are about 350 CAPs in the United States. Allegheny Energy Supply could be the only utility industry to sponsor such groups at its generating facilities across the United States. CAPs are a voluntary measure, and members are selected based upon their representation of community

interest. CAPs are a process to create open dialogue between the sponsoring company and the community. Meeting agendas are set by the panel. Many groups elect to talk about issues such as operations, hiring practices, environmental policies and economic impact. Meetings are open to the public.

Welcome From Allegheny Energy Supply

Kevin Geraghty, company regional director and project manager, welcomed the panel and encouraged everyone to participate. He talked about the company's commitment to the panel process and his personal belief in their benefit. He talked about the company's performance record, but urged members to find out for themselves and develop their own opinion. He said the company is committed to being a good neighbor. Members can learn more about the company by logging on to www.alleghenyenergy.com. [Information about the company will be sent directly to members by Allegheny.] The company as a whole employs about 5,800 people.

Kevin talked about the type of company Allegheny is and its philosophy. He said until recently, the company was located in the eastern part of the states. Primarily in West Virginia, Ohio, Virginia, Pennsylvania and Maryland. The company is the one of the lowest cost producer of electricity east of the Mississippi. The company consists of three operating pieces, Allegheny Power, Allegheny Energy Supply and Allegheny Ventures.

The new facility for LaPaz County will be a gas-turbine facility, which the panel will discuss in detail during its June meeting. One employee has been hired, John Anna. John will manage the station. The company has opened an office in Goodyear to be close to consultants on the project. Construction should begin next August. Operations should begin in the later part of 2004. At this point, the company is working to apply for permits. Kevin said the plant will be the cleanest gas-fired facility in Arizona. It will meet California air standards, which Kevin said he is very proud of.

The panel asked about hiring practices and education requirements. Kevin said employee hiring will probably begin in March or April 2002. Employees will be added as the project progresses. All but seven jobs do not require a college degree. Of the seven, two require an associate degree, and the remaining five require a bachelor degree. Kevin said he hopes to be able to recruit locally for employees. He said it's very important to get responsible employees. He said the average years of experience for employees at Allegheny Energy Supply's existing facilities is 18 years. The panel agreed to talk about hiring needs in detail at a future meeting.

As for construction of the facility, Kevin said the general contractor will hire construction workers. Kevin suggested the contractor could talk with the panel about its plans. Kevin said at the height of construction, 275 to 300 contractors could be on site.

As for the permitting process, Kevin talked about the various permits and the application process for each. The panel agreed this would be an interesting topic for a future meeting.

Kevin encouraged members to contact him with concerns or questions. He said the best way is by cell phone. His number is 412-302-9113. His email is kgeragh@alleghenyenergy.com.

Membership Responsibility

Mary said the panel exists to ensure a communications process is developed between the company and the community. She said those present represent the overall community and are encouraged to bring concerns and issues to meetings. Mary encouraged members to commit to attending all meetings. She said open and honest dialogue also is necessary. Members are asked to give input and feedback to Allegheny Energy Supply and to pass information on to others in the area.

Introduction of Bylaws

The panel reviewed a draft set of bylaws. Mary said the document outlines the formal process by which the panel will operate. Members are asked to review them and to come prepared to the next meeting to make any changes and to work toward adoption.

Team Agreement

Mary said the team agreement outlines how the members will treat each meeting. It is an informal agreement. The elements the group agreed to are:

- Begin/end on time
- Listen
- Be respectful
- Stick to agenda
- Take turns speaking
- Recognize may not always agree
- Seek consensus

Questions/Concerns/Issues

The panel said very little has been said in the community about the company. What has been discussed has been positive. Mary encouraged members to bring any issues or concerns to future meetings.

Future Meetings and Agenda Topics

The panel agreed to have its next meeting on Thursday, June 28. At that time, a regular meeting date and time will be set. Agenda topics for the future will include an overview of the plant; hiring practices and educational needs; construction schedule and plans; operational practices; health, safety and environmental practices; history of company; economic impact; contractor presentation; materials used at plant; permits; presentation by Zachary. Members were asked to give thought to topics they like to discuss and to bring them to the next meeting. Weighted voting will be used to determine the meeting topic for future meetings. Mary asked members to let her know if issues come up that they would like to add to an agenda. She said this also can be done at the beginning of a meeting.

Community Information Meetings

Kevin said since there seems to be an interest in the community to learn about the site, he would like to know if the community would like to have information sessions. The panel said that would be beneficial. Kevin asked when, where and how people should be notified. Members said meetings should be held on Mondays, Tuesdays or Thursdays, between 6:30 p.m. and 9 p.m. Locations to consider are Vicksburg, Wenden/Salome, Parker and Quartzite. Methods to promote the meetings should include the chamber newsletters, post office bulletin boards, Arizona Outback website, local newspaper, and CAP notification. Rev. Lester Ray said he would also place the information in his church bulletin. Kevin said he hopes to have the meetings in early June. He will update the panel on how things went. Also, the panel said all materials should be bilingual.

Next Meeting Date and Agenda

The June 28 meeting will include an overview of the plant (including an artist's rendering), proposed transmission routes, water usage, environmental data, archeological studies, employment needs, capacity, natural gas availability and heat rates.

The panel also will finalize its bylaws and select a regular meeting date. Agenda topics also will be selected.

Mary thanked everyone and asked them to call her with any questions. She encouraged feedback about the meeting. [A membership list is attached to these minutes.]

There being no further business, the meeting was adjourned at 8 p.m.

Next Meeting Date: **June 28, 2001**
5:30 p.m. – Dinner
6 p.m. – Meeting
Wenden Elementary School

Facilitator: Mary A. Lovejoy
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Allegheny Energy Supply - LaPaz County Community Advisory Panel
Master Member List

A - Community Member

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B - Company Representative

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DRAFT
BYLAWS OF THE ALLEGHENY ENERGY SUPPLY - LAPAZ COMMUNITY ADVISORY PANEL

ARTICLE I - Name and Purpose

The name of this non-profit, volunteer entity shall be the Allegheny Energy Supply – LaPaz Community Advisory Panel (CAP). The panel shall serve as a forum for open discussion between representatives of Allegheny Energy and La Paz County.

The CAP shall meet regularly with representatives of Allegheny Energy to discuss issues of concern to both citizens and the company. The CAP shall be a mechanism for the public to convey its questions, comments or concerns to representatives of Allegheny Energy. At the same time, it shall provide a forum for the company to respond directly to residents of the surrounding community.

The objectives of the CAP include, but are not limited to:

1. Provide feedback from the community about plant operations and concerns and identify ways to improve communications with the community.
2. Provide input to the community from the plant about facility operations and concerns.
3. Provide a mechanism for the plant to discuss community response to plant ideas and plans.
4. Address related community/industry issues that are important to the community.
5. Provide a means to educate plant and corporate management about the community.
6. Provide a means to educate community leadership about the plant.

The goal of the CAP is that both groups establish a regular dialogue and that community members will be able to share advice that will assist Allegheny Energy in improving its operations.

The panelists shall serve as an advisory group and not a decision-making body for Allegheny Energy. However, their opinions shall be relayed and considered at the plant and corporate level. Allegheny Energy shall act as the organizer of the CAP.

ARTICLE II - Membership

Section 2.1 Composition

The Community Advisory Panel (CAP) shall be composed of up to 25 members from the areas listed in the first section.

The CAP members shall represent a cross section of the community, and may include clergy, educators, homemakers, workers, retired persons, business persons, consumers and others. The composition will vary and will be determined by the company.

Allegheny Energy shall be represented at the CAP meetings, but shall not have voting privileges.

A facilitator shall facilitate CAP meetings, be responsible for preparing meeting agendas, and serve as a resource for the CAP in planning programs and projects. The facilitator does not have voting power, nor shall he/she be an advocate for the company.

Section 2.2 Selection

Members of the CAP shall be invited by Allegheny Energy with advice from community leaders and the CAP. They shall be chosen based on their participation in their community and their representation of important community interests.

Section 2.3 Resignations

A member may resign his or her membership at any time by written resignation delivered to the facilitator.

Section 2.4 Appointment of New Members

New members of the CAP shall be invited by Allegheny Energy with advice from the CAP. Notification of the selection shall be sent via written communication.

Section 2.5 Attendance

Attendance is important to the CAP. If a member misses 3 consecutive meetings without explanation or notification, the member will be terminated.

Section 2.6 Compensation.

Members shall not be compensated for their participation on the CAP.

ARTICLE III - Meetings: Format, Frequency

Section 3.1 Regular Meetings

The meetings shall be held at Wenden Elementary School, unless otherwise agreed by the membership and the company.

Section 3.2 Meeting Agendas

Agendas shall be prepared by the facilitator, with input from CAP members and the company.

Section 3.3 Notification of Meetings

Members shall be notified of the meetings via written correspondence sent by the facilitator within two weeks of the meeting date.

Section 3.4 Special Meetings

Special meetings of the members may be called at any time by the company or a majority of the CAP members. Proper notice of the special meeting shall be coordinated by the facilitator.

Section 3.5 Quorum

A simple majority of voting members present shall constitute a quorum for the transaction of business at any meeting of the members.

Section 3.6 Vote Required

If a quorum is present at a meeting, action taken by a majority of the members present and voting shall be sufficient to transact any business. The goal will be to find consensus among the group before a vote is taken.

Section 3.7 Method of Voting

Each CAP member shall be entitled to one voice vote at any meeting of the members. Written ballot may be utilized at the request of any member. The goal will be to find consensus among the group before a vote is taken.

Section 3.8 Minutes

Minutes shall be kept by the facilitator and distributed to members within 10 days of the meeting date. The minutes shall be available for public inspection unless restricted by a majority vote of the CAP.

Section 3.9 Executive Session

By a majority vote of the CAP, members may move their meeting to Executive Session, requesting that visitors be prohibited from attending. Either all or part of a CAP meeting may be held in Executive Session.

ARTICLE IV - Miscellaneous

All meetings shall be open to the public, except at such times as CAP members move to Executive Session, as referenced in Article III Section 3.9.

ARTICLE V - Amendment of Bylaws

These bylaws may be repealed or amended by a majority vote of members at any CAP meeting at which a quorum shall be present. Notice of possible action on the bylaws must be given at the previous regularly scheduled meeting.

WENDEN, ARIZONA UPDATE

WENDEN-SALOME FLOOD RECOVERY COMMISSION
George J. Saiter, Executive Director Ph. 520-859-3858
April 18, 2001

MITIGATION

LaPaz County has awarded the contract for appraising the property in the proposed buyout area of Wenden. A team has started work in Wenden. The County has not yet announced the target date for buying the damaged properties. LaPaz County is going to offer to buyout 27 lots in the most severely damaged area of Wenden. The county has a $500,000 plus grant from the federal government for the buyout. There must be a 25% match from the county. They plan to turn the area into a desert park.

NEEDS ASSESSMENTS

A volunteer team led by Dick Eskes from the Christian Reformed Church interviewed fifty-nine flood victims during the first week of March 2001. Since then George Saiter, director of Wenden-Salome Flood Recovery Commission, has interviewed eight more families and added them to the client list needing assistance. There are thirty to forty families yet to be assessed. Many have moved out of the area and are not easily contacted. Some are living with relatives or friends.

Estimated losses of those interviewed amount to $1,194,080. After all the aid from FEMA, SBA, IFG and local relief is considered the unrecovered losses come to $584,892.

ARIZONA VOLUNTEER ORGANIZATIONS ACTIVE IN DISASTERS

Saiter has been meeting regularly with the VOAD group. They have made many valuable suggestions. The committee has donated $1000 money to WSFRC. This was the first donation to be received by WSFRC. It was most welcome since there was a phone bill due.

ALLEGHENY ENERGY

Allegheny Energy plans to build an electric generating plant in Southern LaPaz County. When the plant is completed in June of 2004 the assessed value will be equal to the present assessed value of the entire county of LaPaz. Saiter recently met with Kevin Geraghty, project manager for the new plant. During their meeting Geraghty suggested Saiter write a letter requesting a grant. The grant has been approved. James Garlick, vice president of Allegheny Energy, will present a check to the WSFRC board of directors on May 8, 2001!

CHURCH WORLD SERVICES

The Church World Service Emergency Response Office has awarded WSFRC with a start-up grant. A check for $3000 was received on April 10, 2001.

RELOCATION

When the county buys out the twenty-seven lots there is another problem... where to relocate the families.? There are only a few available lots in town. The high land around Wenden is owned by the city of Phoenix. Phoenix bought approximately 19,000 acres surrounding Wenden about fifteen years ago for the water rights.

The town of Wenden needs to maintain or increase the size of the town. The Wenden Water Company stands to lose almost 10% of its customers due to the flood. This will impact on its ability to repay bonds. Our school system could also be affected negatively.

Community development becomes a significant goal of WSFRC in the effort to return the town to normalcy. With this in mind Saiter and (pro-bono) attorney, Bill Staudenmaier, have approached the city of Phoenix with the request for a donation of a parcel of land adjacent to the town. The land needs to be attached to the town so it can be served by the Wenden Water Company.

The response from the Phoenix representative has been positive. Since Wenden is not incorporated there is no viable entity to receive the land. Therefore, WSFRC is moving ahead to incorporate and develop a 501(c)(3) corporation so it can be the trustee of the land.

FUNDS FOR NEEDY

The Wenden Bible Church and the Salome Lion's Club have made some limited funds available to needy families who have been affected by the floods. The funds are available through the WSFRC office. See Saiter if you feel you have an urgent need. One washing machine, one cooler, rent help, and a refrigerator have been approved.

ADVOCACY

A large part of Saiter's time is devoted to advocacy for the flood victims. A number of appeals have been written to FEMA, SBA and insurance companies. Saiter is also available to help complete forms and to provide advice and alternatives for any flood victim. Sometimes it's important just to listen.

The Wenden-Salome Flood Recovery Commission office is at the Wenden Bible School, room 5, on Cedar Street. George has office hours Monday, Tuesday, and Friday 10:00 A.M. to 2:00 P.M. and other times by appointment. Wenden-Salome residents are invited to drop in if they need help with anything related to the flood: emergency support, complete forms, write appeals, advice, or just someone to listen.

PUBLIC MEETING MATERIALS AND MEDIA COVERAGE

La Paz County Generating Facility

Open House

Allegheny Energy Supply, which proposes to build a 1080-megawatt natural gas-fired generating facility in eastern La Paz County, is hosting a series of open houses for the public to learn more about Allegheny Energy Supply and the facility.

All sessions will run from 6:30 pm to 9:00 pm. You may show up at any time. Representatives from Allegheny Energy Supply will be available to discuss the proposed project and answer your questions. Refreshments will be served.

Dates and locations:

Monday, June 11, 2001
- Arizona Western College Vocation Complex, 601 11th Street, Parker

Tuesday, June 12, 2001
- Wenden Elementary School, Wenden

Tuesday, June 19, 2001
- Quartzite Town Hall Quartzite

Allegheny Energy Supply
an Allegheny Energy company

Allegheny Energy Supply Co.
La Instalación Generadora del Condado La Paz
Casa Abierta

Allegheny Energy Supply, la cual propone construir una planta generadora de energía de 1080 MW impulsada por gas natural en el este del Condado La Paz, realizará una serie de casas abiertas para que el público pueda informarse sobre la compañía Allegheny Energy Supply y las instalaciones propuestas.

Todas las sesiones presentarán la misma información y se llevarán a cabo de 6:30 p.m. a 9:00 p.m. Los visitantes pueden presentarse a la hora que sea – no habrá presentaciones formales. Los representantes de Allegheny Energy Supply estarán disponibles para hablar sobre el proyecto propuesto y para responder a sus preguntas sobre las instalaciones propuestas.

Se ofrecerán refrigerios.

Fechas y ubicaciones:

Lunes 11 de junio de 2001 – Parker – Complejo Vocation Complex del Colegio Arizona Western College - 601 11th Street

Martes 12 de junio de 2001 – Wenden – Escuela Wenden Elementary School

Martes 19 de junio de 2001 – Quartzite – Edificio Municipal Quartzite Town Hall

Si tiene alguna pregunta, por favor comuníquese con Kevin Geraghty llamando al 412-302-9113 ó al 412-858-5492, ó por correo electrónico a kgeragh@alleghenyenergy.com.

PLEASE SIGN IN

Parker, AZ - June 11, 2001

Allegheny Energy Supply

La Paz

Generating Facility

Name	Address	Phone Number (optional)

Names and addresses are being withheld for confidentiality.

Allegheny Energy Supply

an Allegheny Energy company

PLEASE SIGN IN

Wenden, AZ - June 12, 2001

Allegheny Energy Supply

La Paz

Generating Facility

Name	Address	Phone Number (optional)

Names and addresses are being withheld for confidentiality.

Allegheny Energy Supply

an Allegheny Energy company

PLEASE SIGN IN

Quartzsite, AZ - June 19, 2001

Allegheny Energy Supply

La Paz

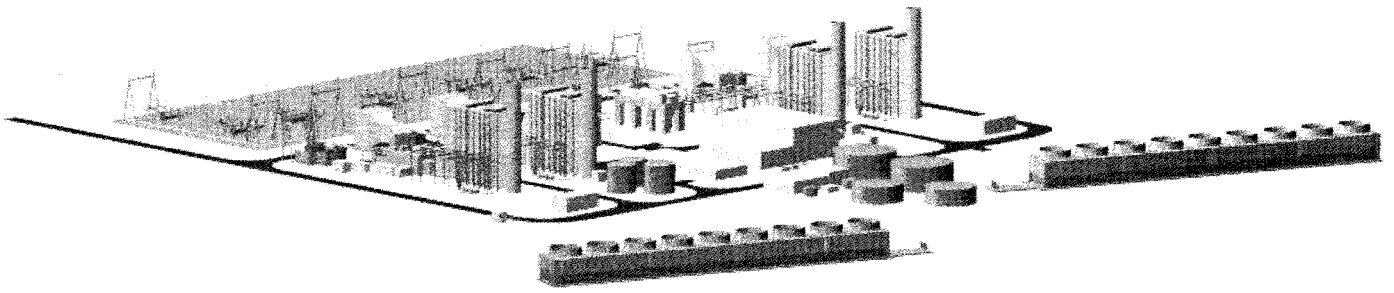
Generating Facility

Name	Address	Phone Number (optional)

Names and addresses are being withheld for confidentiality.

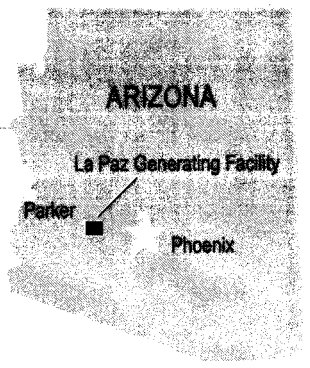
Allegheny Energy Supply

an Allegheny Energy company



At A Glance

- 1,080-megawatt combined-cycle facility
- Fueled by clean-burning natural gas
- Electricity to be sold into the Western System Power Pool
- Employs 30-40 people
- Annual contribution to local and state tax base is estimated at $8 million to $15 million
- Construction to begin in mid- to late-2002, employing about 400 craftspeople at peak periods
- Slated for commercial service in 2005



Allegheny Energy Supply
La Paz
Generating Facility

The Facility

The Allegheny Energy Supply La Paz Generating Facility, located approximately 21 miles southeast of Wenden & Salome in rural La Paz County, Arizona, is a highly efficient 1,080-megawatt (MW) combined-cycle, base-load electrical generating facility. The facility will provide electric power - enough to light more than one million homes - for sale into Arizona and other states served by the Western System Power Pool.

Technology and Environmental Performance

Allegheny Energy Supply La Paz Generating Facility will be fueled by clean-burning natural gas. The plant's advanced technologies will produce power using far less fuel than conventional steam-electric generating facilities.

Combined with the use of clean-burning natural gas, advanced combustion and environmental control technologies will reduce air emissions of sulfur dioxide, nitrogen oxides, and particulate matter to levels well within state and federal standards, and well below emissions levels of most older fossil fuel plants.

Allegheny Energy Supply

an Allegheny Energy company

The facility will comply with groundwater conservation and usage limitations applicable in the area where it is located. Allegheny Energy Supply has purchased more than 2,100 acres of irrigated land for the facility. Grandfathered groundwater rights associated with this land will allow Allegheny Energy Supply to withdraw sufficient groundwater for operations without depleting local groundwater resources. The facility will use 40% less water than agricultural demands (i.e., cotton, produce, alfalfa) on compatible acreage.

Stewardship

Allegheny Energy Supply has a strong commitment to the environment and the local community wherever it operates power generating facilities. Since the passage of the Clean Air Act, Allegheny has invested more than $2 billion in environmental activities at its existing generating facilities. Since 1980, we have decreased our emissions of gases such as sulfur dioxide by approximately 50 percent and nitrogen oxides by approximately 35 percent.

In addition, Allegheny manages a number of environmental issues and cultivates a positive relationship with neighbors and customers through a strategic corporate policy that encourages employee involvement and emphasizes compliance, research and development, and stewardship. Recently, Allegheny donated $10,000 to assist with flood recovery efforts in Wenden, Arizona.

Ownership and Management

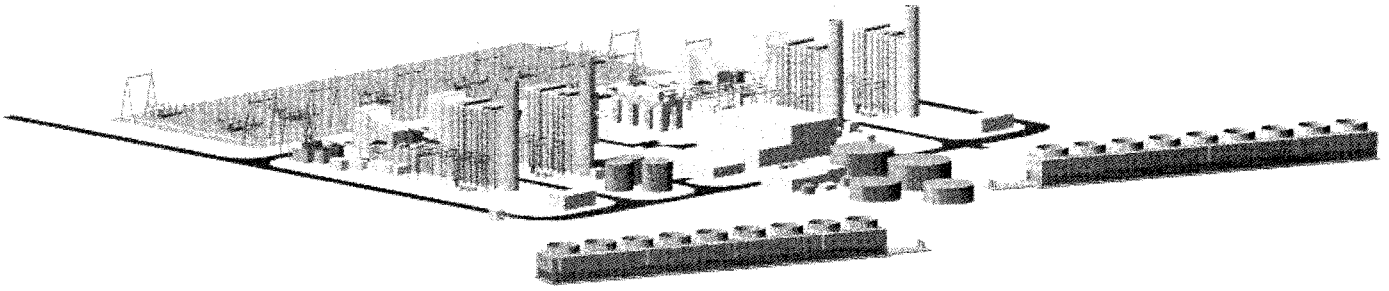
The Allegheny Energy Supply La Paz Generating Facility will be owned by Allegheny Energy Supply Company, LLC, an Allegheny Energy company that operates and markets retail and wholesale electric generation throughout competitive United States' markets and operates regulated generation for its affiliates. Allegheny Energy Supply is a leader in the production of low-cost electric generation, owning and managing a portfolio of reliable, efficient electric generation that will exceed 14,000 megawatts with the addition of this generating facility.

For more information, contact:

Kevin C. Geraghty
Regional Director, Western Region
Allegheny Energy Supply
McDowell Road Professional Plaza, Suite 201
14122 West McDowell Road
Goodyear, Arizona 85338

(623) 536-6310
kgeragh@alleghenyenergy.com

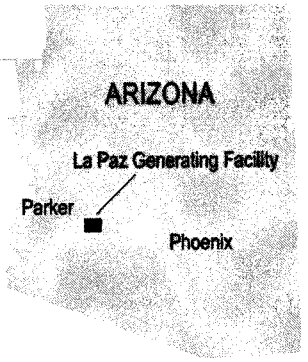
Allegheny Energy Supply
an Allegheny Energy company



At A Glance

Un Vistazo

- Instalación de ciclo combinado de 1,080 megavoltios
- Propulsada por gas natural de quemado limpio
- La electricidad será vendida por medio del grupo de energía Western System Power Pool
- Emplea de 30 a 40 personas
- Se calcula que la contribución anual a la base local y estatal de impuestos es de $8 millones a $15 millones de dólares
- La construcción comenzará de mediados a finales de 2002, empleando aproximadamente a 400 artífices en los períodos de mayor trabajo
- Programada para proporcionar servicio comercial en 2005



Allegheny Energy Supply
La Paz
Generating Facility

Instalación Generadora La Paz

ALLEGHENY...
Instalación Generadora
La Paz de Allegheny Energy Supply

La Instalación

La Instalación Generadora La Paz de Allegheny Energy Supply, ubicada aproximadamente a 21 millas al sudeste de Wenden y Salome en el área rural del Condado La Paz en Arizona, es una instalación altamente eficiente de ciclo combinado de 1,080 megavoltios (MW) de carga fundamental de electricidad. La planta proveerá suficiente energía eléctrica para iluminar más de un millón de hogares – y será puesta a la venta dentro de Arizona y en otros estados que reciban servicio por medio del grupo de energía Western System Power Pool.

Desempeño Tecnológico y Medioambiental

La Instalación Generadora La Paz de Allegheny Energy Supply, será propulsada por gas natural de quemado limpio. Las tecnologías avanzadas de la planta producen energía usando mucho menos combustible que las instalaciones convencionales de electricidad generada a vapor.

Allegheny Energy Supply
una compañía de Energía Allegheny

La combinación del uso de gas natural de quemado limpio, combustión avanzada y tecnologías de control medioambiental reducirá las emisiones al aire de dióxido de sulfuro, óxidos de nitrógeno, y material constituido de partículas, a niveles dentro de los estándares estatales y federales, y a niveles de emisiones mucho más bajos que los de la mayoría de las plantas de combustible fósil más antiguas.

La instalación cumplirá con la conservación del agua subterránea y las limitaciones de uso aplicables en el área en la cual está ubicada. Allegheny Energy Supply ha adquirido más de 2,100 acres de terrenos irrigados para la instalación. Los derechos adquiridos anteriormente del agua subterránea asociados con estos terrenos, permitirán a la Compañía extraer suficiente agua subterránea para las operaciones sin agotar los recursos locales de agua subterránea. Las instalaciones usarán 40 por ciento menos agua que usos agrícolas (ejem. algodón vegetales, alfalfa) en cantidades comparables de acres.

Administración

Allegheny Energy Supply está intensamente dedicada al medioambiente y a las comunidades locales en las cuales opera sus instalaciones generadoras de energía. Desde que pasó el Decreto del Aire Limpio, Allegheny ha invertido más de $2 mil millones de dólares en actividades medioambientales en sus instalaciones existentes de generación. Desde 1980, hemos reducido aproximadamente 50 por ciento de nuestras emisiones de gases como dióxido de sulfuro, y los óxidos de nitrógeno por aproximadamente 35 por ciento.

Además, Allegheny administra varios asuntos medioambientales y cultiva una relación positiva con nuestros vecinos y clientes por medio de una norma corporativa estratégica que anima el envolvimiento de los empleados y enfatiza el cumplimiento, la investigación y el desarrollo, y la administración. Recientemente, Allegheny donó $10,000 dólares para ayudar con los esfuerzos de recuperación por una inundación en Wenden, Arizona.

Propiedad y Administración

La Instalación Generadora La Paz de Allegheny Energy Supply será poseída por Allegheny Energy Supply Company, LLC, una compañía de Allegheny Energy que opera y comercializa generación eléctrica al menudeo y mayoreo a través de mercados competitivos en los Estados Unidos, y opera generación regulada para sus afiliadas. Allegheny Energy Supply es un líder en la producción de generación eléctrica a bajo costo, poseyendo y administrando una cartera de generación de electricidad confiable y eficiente que excede a los 14,000 megavoltios, con la adición de esta instalación generadora.

Para más información, contacte a:

Kevin C. Geraghty
Regional Director, Western Region
Allegheny Energy Supply
McDowell Road Professional Plaza, Suite 201
14122 West McDowell Road
Goodyear, Arizona 85338

(623) 536-6310

Allegheny Energy Supply
una compañía de Energía Allegheny

About Allegheny Energy

- Allegheny Energy, Inc., (NYSE: AYE) headquartered in Hagerstown, Md., is a strong diversified energy company on the leading edge of change.
- Named to Fortune 500, S&P 500 Index and Forbes Platinum 400.
- Dedicated to increasing shareholder value, becoming a successful national supplier of energy and value-added energy services, and diversifying into other ventures related to core business.
- Invaluable expertise – 100-year history of generating and delivering electricity with roots in the Mid-Atlantic Region.
- Low-cost generation and outstanding operations keep rates among the lowest in the country – Owns or controls nearly 12,000 MW and is in the process of building more than 2,300 MW.
- Committed to communities with environmental, educational, economic development, and charitable initiatives.

The Allegheny Energy Family

- **Allegheny Energy Supply** operates and markets retail and wholesale electric generation in competitive markets and operates regulated generation for its affiliates.
- **Allegheny Power** delivers low-cost, reliable energy to about three million people in parts of Maryland, Ohio, Pennsylvania, Virginia, and West Virginia.
- **Allegheny Ventures** actively invests in and develops telecommunications and energy-related projects.
- **Allegheny Energy Service Corp.** provides shared services in support of the Allegheny Energy businesses.

Allegheny Energy Generation Mix

- Nearly 12,000 MW of low-cost generation – 66% coal-fired, 24% natural gas-fired 0.5% hydroelectric, 8% pumped-storage, and 1% oil.
- Complies with all local, state and federal laws - invested $2 billion in environmental compliance since late 1970s.
- Plans to build more than 2,300 MW (mostly gas-fired) through 2005:
  - 1,080 MW in Arizona;
  - 630 MW in Indiana;
  - 628 MW in Pennsylvania.

Allegheny Energy

Allegheny Energy to have open house for county residents

Allegheny Energy Supply, the unregulated generation subsidiary of Allegheny Energy, Inc. (NYSE: AYE), will hold three open house informational sessions on the proposed 1,080-megawatt natural gas-fired generating facility that it plans to construct in eastern La Paz County.

"Allegheny Energy Supply wants to be a good corporate neighbor in La Paz County," said Kevin Geraghty, regional director for Allegheny Energy Supply's Western Division. "We want to give the residents the opportunity to find out more about the project and to ask questions."

Information will be available at the open house on the technical and environmental aspects of the project, as well as the construction plans and permitting process.

The open house sessions will be held:

June 11, at Arizona Western College vocation complex, at 601 11th St., in Parker.

June 12, at Wenden Elementary School, in Wenden.

June 19, at Quartzite Town Hall, in Quartzite.

All sessions will be held from 6:30- 9 p.m. The public is invited to attend. Refreshments will be served.

For information,contact Kevin Geraghty at (412) 302-9113

Source: Parker Pioneer, June 6, 2001

Allegheny Energy Supply to hold open house on La Paz Generating Facility

Allegheny Energy Supply, the unregulated generation subsidiary of Allegheny Energy, Inc. (NYSE: AYE), will hold three open house informational sessions on the proposed 1,080-megawatt natural gas-fired generating facility that it plans to construct in eastern La Paz County.

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For more information, contact Kevin Geraghty at 412-302-9113

Source: The Sun Times, Week of May 31 – June 7, 2001

Allegheny Energy Supply To Hold Open House On La Paz Generating Facility

LA PAZ COUNTY - Allegheny Energy Supply, the unregulated generation subsidiary of Allegheny Energy, Inc. (NYSE: AYE), will hold three open house informational sessions on the proposed 1,080-megawatt natural gas-fired generating facility that it plans to construct in eastern La Paz County.

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For more information, contact Kevin Geraghty at 412-302-9113.

Source: The Sun Times, Week of May 31 – June 7, 2001

PRESS RELEASES

Allegheny Energy Supply to Construct $540-Million Power Plant in Arizona
1,080-MW Merchant Facility Will Begin Operations in 2005

Greensburg, Pa., October 18, 2000 – Allegheny Energy Supply Company, LLC, the unregulated generation subsidiary of Allegheny Energy, Inc. **(NYSE: AYE)**, announced plans today to construct a 1,080-megawatt (MW) natural gas-fired merchant generating facility in La Paz County, Arizona, approximately 75 miles west of Phoenix. The addition will give the Company about 11,000 MW of total generating capacity and marks yet another major step toward the Company's goal of becoming a national energy supplier.

Construction is expected to begin on the $540-million combined-cycle facility in 2002. When completed in 2005, the facility will allow Allegheny Energy Supply to sell generation into Arizona and other states served by the Western System Power Pool.

The facility will be accretive to earnings in the first year of operation and will give added value to Allegheny's shareholders, according to Peter J. Skrgic, President, Allegheny Energy Supply.

"This is very significant for Allegheny Energy Supply," said Skrgic. "It not only gives our Company its first generating capacity in the western United States, but it also represents a substantial step on our way to becoming a national energy supplier, which is a positive benefit for our Company and its shareholders."

Skrgic pointed out that the facility would sell generation into the interconnected markets in the Southwest and have benefits for the state of Arizona and the entire region.

"This plant will enable Allegheny Energy Supply to be well-positioned to supply generation in Arizona and throughout the Southwest region to meet the growing demand for electricity," he said. "Additionally, construction of this facility will provide approximately 400 construction jobs and another 30 to 40 permanent jobs."

The La Paz County Board of Supervisors applauded Allegheny Energy Supply's announcement.

"We are delighted with Allegheny Energy Supply's choice of locations for its facility," said Joyce Barker, La Paz County Supervisor. "Allegheny Energy Supply has an excellent reputation in the East, and our county will see a big boost in the economy during construction, as well as several million dollars in increased tax revenue once it is complete."

Allegheny Energy Supply has also announced construction of another 540-MW combined-cycle facility in Springdale, Pa., and is installing five 44-MW simple-cycle combustion turbines throughout Pennsylvania.

Allegheny Energy Supply, an Allegheny Energy company, operates and markets competitive retail and wholesale electric generation throughout competitive United States markets and operates regulated generation for its affiliates. For more information about Allegheny Energy Supply, visit our web site at www.alleghenyenergysupply.com.

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Allegheny Energy Supply celebrates two West Virginia environmental initiatives with groundbreaking of biomass project and dedication of gypsum facility

Willow Island, W.Va., October 19, 2000 Allegheny Energy Supply, the unregulated generating subsidiary of Allegheny Energy, Inc. (NYSE: AYE), today celebrated the groundbreaking of a unique biomass project at Willow Island Power Station in Pleasants County, W.Va., while also dedicating a facility at its adjacent Pleasants Power Station that manufactures gypsum using a flue gas scrubbing process by-product.

Speaking at the groundbreaking/dedication ceremony, West Virginia Governor Cecil Underwood praised both projects and commended Allegheny Energy Supply for its commitment to West Virginia, the economy, and the environment.

"Allegheny Energy Supply is to be commended for its high standards of environmental stewardship and its exemplary efforts as a good corporate citizen," said Underwood. "With creative environmental initiatives such as the Biomass Co-firing Project and the Gypsum Processing Plant, coal combustion by-products and wood waste are being used in ways that improve and enhance the environment in which we live and work. These are the very types of projects which this administration has been promoting to enable us to continue using West Virginia coal in an economical and environmentally sound manner."

Peter J. Skrgic, President, Allegheny Energy Supply, said the projects are examples of the Company's steadfast commitment to the region's economy, while continuing its efforts to preserve and protect its natural resources.

"Although these are two distinctly different projects, they have a common thread. Both allow us to use one of the region's most precious natural resources – coal – to generate electricity, while enhancing the environment in which we live," Skrgic said.

The biomass project was made possible by a $2.4-million research and development cooperative agreement from the U.S. Department of Energy (DOE). The three-year project will adapt the Company's 188-megawatt (MW) Willow Island Unit No. 2 to co-fire sawdust with coal and tire-derived fuel (TDF), reducing fuel costs and nitrogen oxide emissions.

The biomass project is part of the DOE Office of Energy Efficiency and Renewable Energy's Biomass Cofiring Program, managed by the National Energy Technology Laboratory. It will combine 80 percent coal with 10 percent biomass and 10 percent TDF. The output will meet Renewable Portfolio Standards, which include wind, solar, low-head hydro, landfill gas, and biomass, such as crops, trees, and other agricultural and forestry residues.

The $44-million gypsum project at Pleasants uses a chemical process to turn the waste slurry from the exhaust-gas scrubbing process into gypsum that can be used to make drywall or wallboard. The plant, which began operation in September, is designed to use more than 600,000 tons of waste slurry by-product that would otherwise go to a landfill.

Allegheny Energy Supply, an Allegheny Energy Company, operates and markets competitive retail and wholesale electric generation throughout competitive markets in the eastern United States and operates regulated generation for its affiliates. For more information about Allegheny Energy Supply, visit our web site at www.alleghenyenergysupply.com.

Allegheny Energy Supply's Harrison Power Station
To Receive Environmental Education Leadership Award

Greensburg, Pa.,April 19, 2000 Employees at Allegheny Energy Supply's Harrison Power Station have been selected to receive an Environmental Education Leadership Award from the West Virginia Division of Environmental Protection (DEP) for its involvement in Project WET (Water Education for Teachers). West Virginia Governor Cecil H. Underwood will present the award today in Charleston as part of a ceremony recognizing industry representatives and community leaders statewide.

"Allegheny Energy and its employees are committed to protecting the environment," said George Dragich, Regional Director for Allegheny's Harrison/Rivesville Region. "We are very proud of the work our employees put into the projects that benefit our communities, including the organization and operation of the Project WET Workshops. We are very honored to be receiving this award from the West Virginia Division of Environmental Protection and Governor Underwood."

Located near Shinnston, W.Va, the 1,950-megawatt Harrison Power Station is the largest power station operated by Allegheny Energy Supply and employs 234 workers. During the last two years, the station has partnered with the DEP to provide Project WET workshops for educators at Harrison Power Station. The workshops have been attended by teachers, 4-H, and community leaders, and they promote the effectiveness of education in environmental stewardship.

The next Project WET workshop is scheduled for June 19 at Harrison Power Station. The workshop covers the various environmental aspects of water, including atmospheric, surface, and ground water; chemistry; water history; watersheds; wetlands; aquatic wildlife; water quality; and water stewardship. It involves demonstrations and classroom activities, and each participant receives a *Project WET Curriculum and Activity Guide* that provides ideas and activities for use in all subject areas and grade levels. In addition, participants are also taken on a tour of the Harrison Power Station that emphasizes the various uses of water in the production of electricity.

Harrison and the neighboring Rivesville Power Station in Marion County have an ongoing commitment to environmental and community stewardship, which includes a number of partnering, recycling, educational, and community projects in addition to Project WET. For example, in conjunction with the Company sponsorship of the national River Sweep, the Harrison/Rivesville Region annually sponsors a clean-up site on the West Fork River, which last year attracted more than 30 volunteers.

The region also participates in Harrison County Earth Week activities and will have an exhibit on display at Meadowbrook Mall this year from April 24-30. The region has recognized local schools for their environmental stewardship for the past two years. They have partnered with the Lower West Fork Watershed Association to provide water quality testing on the watershed.

Harrison employees recently participated in an Allegheny Energy Earth Day 2000 tire collection, and in a recycling project, the station donated used 35-gallon and 55-gallon steel drums to West Virginia University's Tuning Project (UTP) which converts them into musical instruments used in symphony orchestras around the world.

"These are just a few of the many environmental initiatives that Allegheny Energy employees participate in every day," said Dragich. "They are a part of Allegheny Energy's commitment to being a good corporate neighbor and protecting the environment in which our employees live, work, and raise their families."

Allegheny Energy's Land Management Plan Wins Industry Award for Excellence

WEDNESDAY, JUNE 27, 2001 9:03 AM
- BusinessWire
HAGERSTOWN, Md., Jun 27, 2001 (BUSINESS WIRE) -- Allegheny Energy, Inc. (NYSE:AYE) was named first-place winner of the Southeastern Electric Exchange (S.E.E.) "Industry Excellence in Real Estate and Right-of-Way" awards program for its innovative, ecologically protective real estate and right-of-way land management program.
The award is given annually by the S.E.E., a trade association of investor-owned electric utilities, to the member initiating or implementing the most outstanding real estate and right-of-way project.
"Allegheny Energy owns and manages more than 60,000 acres of conservation land in portions of Maryland, Pennsylvania, and West Virginia," says George Yost, Land Management Specialist for Allegheny Energy. "The land holdings, purchased primarily for the development of power generating plants, have become part of a model land management plan that demonstrates the Company's environmental stewardship, promotes biodiversity, and enhances shareholder value by characterizing, enhancing, and preserving ecological resources.
"We take our role as good corporate citizens seriously and strive to ensure that society benefits from the many ecological services our land holdings provide," says Yost.
Through an ongoing partnership with the Electric Power Research Institute (EPRI), Allegheny Energy was able to assess the economic and societal benefits of protecting wetlands, forested watersheds, and important plant and animal species. The property was then formally appraised to include the value of these ecological assets. "The basis for ecological valuation is accurate characterization," says William Coleman, Director of EPRI's Eco-Solutions program. "Because of Allegheny Energy's innovation and sense of social responsibility, shareholders will be rewarded in today's environmental marketplace."
"Allegheny Energy is turning what was once considered intangibles, such as wetlands and endangered species, into environmental assets," says Richard S. Herd, Water Resources Manager for Allegheny Energy, who accepted the award today at the association's annual conference in Miami, Florida. "By quantifying the ecological services -- such as atmospheric regulation, water control and purification, and wildlife habitat -- that ecosystems provide to society, we are able to offset other environmental liabilities, sell, or trade them to other companies, or donate them as a charitable contribution. As environmental bank and trade markets continue to develop and mature, smart landowners will quantify the true value of their environmental holdings and be rewarded for preserving and/or enhancing their forests or wetlands," says Herd.
A panel selected by the S.E.E. judged the entries based on selective criteria, including innovation; improvements; the success, effectiveness, and complexity of the program; and the program's value to shareholders. Earlier this year, the Company received national recognition by earning a Right-of-Way Vistas Lines of Distinction Award for excellence in vegetation management practices on utility rights-of-way.
Allegheny Energy, Inc. is a diversified energy company headquartered in Hagerstown, Md. We have been named to the Fortune 500 list, the Standard and Poor's 500 index, and the Forbes "Platinum 400" list. The Allegheny Energy family includes Allegheny Power, which delivers electric energy and natural gas to about three million people in parts of Maryland, Ohio, Pennsylvania, Virginia, and West Virginia; Allegheny Energy Supply Company, LLC, which operates and markets competitive retail and wholesale electric generation and operates

regulated electric generation for its affiliates; and Allegheny Ventures, which actively invests in and develops telecommunications and energy-related projects. For more information, visit our web site at www.alleghenyenergy.com.

CONTACT: Allegheny Energy, Inc., Hagerstown
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or
Media Hotline: 1-888-233-3583

Thursday April 19, 1:44 pm Eastern Time

Press Release

Allegheny Energy Employee Receives National Recognition for Work Improving Region's Water Quality

HAGERSTOWN, Md.--(BUSINESS WIRE)--April 19, 2001--Richard S. Herd, Water Resources Manager for Allegheny Energy, has been recognized by the Electric Power Research Institute (EPRI) for carrying out the Company's commitment to ensuring the protection of the environment's natural resources.

Herd received the award for his work in Watershed Risk Management during EPRI's recent Environment Sector Council Meeting.

"It is a pleasure to honor Rick Herd for his outstanding achievements in watershed risk management," said Kurt Yeager, EPRI's Chief Executive Officer. "We are profoundly grateful to Rick for his dedication and hard work in this important field."

Allegheny Energy routinely works with organizations to preserve area watersheds. Herd was recognized for working with officials from Region 3 of the U.S. Environmental Protection Agency (EPA) to apply EPRI's Watershed Analysis Risk Management Framework (WARMF) to watershed improvement projects in West Virginia and Pennsylvania. Through the use of the EPRI model, watershed associations and their stakeholders were able to more effectively develop water quality improvement plans for streams in their respective watersheds, with particular regard to the treatment of acid mine drainage.

"I am pleased to receive this honor because it helps to showcase how important environmental issues are to the energy industry in general, and demonstrates Allegheny Energy's leadership and commitment to environmental enhancements in the areas we serve," Herd said. "EPRI's watershed management model was successfully applied to projects in these two states and should serve as a framework for improving water quality conditions all around our region."

Herd joined Allegheny Energy in 1980 and has been recognized on several occasions for his accomplishments in water quality management and wastewater treatment. He chairs several national trade groups and is actively involved in a number of watershed organizations in the region. He earned a master's degree in environmental engineering from the University of Virginia, a master's degree in biology/ecology from Indiana University of Pennsylvania, and a bachelor's degree in biology from Otterbein College.

EPRI, headquartered in Palo Alto, Calif., was established in 1973 as a center for public interest energy and environmental research. EPRI's collaborative science and technology development program now spans nearly every area of power generation, delivery, and use. More than 1,000 energy organizations and public institutions in 40 countries draw on EPRI's global network of technical business expertise.

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Monday April 16, 2:57 pm Eastern Time

Press Release

Allegheny Energy Supply Continues its Commitment to Environmental Excellence by Constructing Wetlands Project at Hatfield's Ferry Power Station

GREENSBURG, Pa.--(BUSINESS WIRE)--April 16, 2001--Allegheny Energy Supply, the unregulated generating subsidiary of Allegheny Energy, Inc. (NYSE: AYE - news), has taken another step toward protecting the environment by constructing a passive wastewater treatment system servicing a portion of its property at its Hatfield's Ferry Power Station in Greene County, Pa.

The system was constructed to meet water quality standards imposed by the Pennsylvania Department of Environmental Protection (DEP) by controlling the leaching of dissolved iron, manganese, and aluminum from an active coal combustion product (CCP) landfill facility near the station.

"Construction of the project is complete, and we began directing water to the area in February," said Thomas Z. Seighman, Regional Director, Hatfield's Ferry/Mitchell/Lake Lynn Region. "As spring unfolds, the vegetation will be taking off, and the project will be fully functional."

To aid in the design of passive wetland systems, a set of guidelines known as Phased Element Removal Technology (PERT(TM)) was developed. In accordance with these guidelines, multiple, sequential treatments to target specific elements in the discharge water were employed in the design and development of the Hatfield's Ferry project.

Allegheny estimates that once the technology is fully implemented at the site, the system will remove, on average, 90 percent of both the iron and the manganese, and 75 percent of the aluminum from the wastewater, along with significantly reducing the presence of other trace metals.

"Allegheny Energy has found that constructed passive wetland treatment systems are an efficient and environmentally sound method of treating industrial wastewater," said Robert H. Collins, Coordinator, Coal Combustion Byproducts and Ash Management, Allegheny Energy Supply. "These systems are also very cost-effective. While no water management facility is totally maintenance free, passive systems require only minor operator involvement, weekly inspections, no mechanical maintenance (except for pumping stations, if necessary), and no consumption of chemicals."

The wetland project at Hatfield's Ferry is the third such development for Allegheny Energy. The first project was constructed near Allegheny's Albright Power Station, located in Albright, W.Va., in 1988. The second wetland project was Allegheny's award winning Springdale Wetland System, which was completed in 1995. Located near the former Springdale Power Station, this system received the Pennsylvania Governor's Award for Environmental Excellence in 1997 and the Industrial Excellence Award from the Pennsylvania Water Environment Association in 1996.

"Passive wastewater treatment has proven to be a reliable and cost-effective alternative to chemical treatment for the Albright and Springdale sites," said Seighman. "Allegheny expects similar results at its Hatfield's Ferry facility."

Allegheny Energy Supply operates and markets competitive retail and wholesale generation in markets throughout the United States and operates regulated generation for its affiliates. With its recently announced acquisitions and expansion plans, Allegheny Energy Supply will have ownership or control of generating capacity of more than 14,000 MW, with assets strategically located throughout the United States. For more information about Allegheny Energy Supply, visit our web site at www.alleghenyenergysupply.com.

Tuesday May 15, 12:18 pm Eastern Time

Press Release

Allegheny Energy Supply Donates $10,000 To Arizona Flood Recovery Effort

MONROEVILLE, Pa.--(BUSINESS WIRE)--May 15, 2001--Allegheny Energy Supply, the unregulated generation subsidiary of Allegheny Energy, Inc. (NYSE: AYE - news), recently donated $10,000 to the flood recovery effort in the Wenden and Salome areas of the McMullen Valley in La Paz County, Ariz. Allegheny Energy Supply has announced plans to build a 1,080-megawatt (MW) natural gas-fired generating facility in the county.

The Wenden-Salome area sustained $12 million in damage in late October 2000 when heavy rains sent floodwaters raging through the streets twice within a five-day period. Approximately 100 homes were damaged or destroyed in the flood.

''Allegheny Energy Supply is pleased to extend its hand and assist our new neighbors in Arizona," said James P. Garlick, Vice President, Projects for Allegheny Energy Supply. ''Wherever we have generating facilities, Allegheny Energy Supply wants to be a good corporate neighbor and part of the community. A flood of the magnitude that swept the McMullen Valley last October is a devastating event. With our donation, we stand ready to help the community rebuild and move forward."

According to George J. Saiter, Executive Director of the Wenden-Salome Flood Recovery Commission, Allegheny Energy Supply is one of the first companies to donate to this cause.

''We estimate that the community has approximately $600,000 in unrecovered flood losses after considering funds from the Federal Emergency Management Agency, the Small Business Administration, insurance and local fund drives," said Saiter. ''The goal of the flood recovery commission is to collect half that amount, and Allegheny Energy Supply's generous donation will go a long way toward that."

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