DOE/EIS - 0322

Sundance Energy Project
Final Environmental Impact Statement

Western Area Power Administration

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DOE/EIS - 0322

COVER SHEET

Title: Sundance Energy Project, Pinal County, AZ, Final Environmental Impact Statement

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ABSTRACT

Sundance Energy LLC (Sundance) has applied to the Western Area Power Administration (Western) to interconnect a planned generator facility to Western's transmission system in the vicinity of Coolidge, Arizona. Western's proposed action is to enter into an interconnection and construction agreement with Sundance for the requested interconnection. The proposed interconnection would integrate the power generated by the Sundance Energy Project (Project) into the regional transmission grid and would allow Sundance to supply its power to the competitive electric wholesale market.

The proposed Project would be built on private lands southwest of Coolidge. The proposed Project would be a Apeaking power plant project@ which means it would provide energy when it is needed during peak demand periods in the region. The proposed Project would also be a Amerchant plant@ which means it is not owned by a utility and there is currently no long-term commitment or obligation by any utility to purchase the energy generated by the power plant.

Western, as a major transmission system owner, must generally provide access to its transmission system when requested by an eligible organization per existing policies, regulations and laws. The proposed Project would consist of the construction and operation of a generating facility; construction of a 14-mile pipeline to supply natural gas to the proposed Facility; a new 230-kV bay at an existing substation; a new double-circuit 230-kV transmission line; a new single-circuit 230-kV transmission line; an upgrade of a 115-kV line to 230-kV specifications; and an upgrade of an existing substation. Three alternatives would consist of different locations of the 230-kV transmission lines and would not involve upgrading the 115-kV line or the existing substation. The environmentally preferred alternative is Alternative 3, the power line routing that is furthest west.

CHANGES SINCE THE ISSUANCE OF THE SUNDANCE ENERGY PROJECT DRAFT EIS

The Sundance Energy Project Draft Environmental Impacts Statement (DEIS) was issued on March 23, 2001. A public hearing was held in Coolidge, Arizona on April 12, 2001. The comment period ended on May 7, 2001. Comments from 15 individual commentors were received on issues associated with the proposed Sundance Energy Project (Project). These comments were considered and where appropriate changes to the Draft EIS were made. The comments and responses to the comments were collated into a Comment Response Document. The Comment Response Document is included in this Final EIS as Appendix C.

The changes to the analyses and discussion presented in the DEIS were minor and confined to the reassessment of air quality, and additional information concerning water and cultural resources (see below). In these circumstances the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) (40 CFR Parts 1500.4 and 1503.4) call for "attaching and circulating only changes to the draft environmental impact statement, rather than rewriting and circulating the entire statement." Therefore, this Final EIS is not a reprint of the Draft EIS. This Final EIS includes the amended sections of the Draft EIS and the Comment Response Document, Appendix C. In addition, the amended analyses and new information was carried forward into the Summary and cumulative impact sections that are also included in this Final EIS.

Shortly after the issuance of the DEIS, the Pinal County Air Quality Control District completed its review of the Sundance Air Permit Application. The Pinal County Air Quality District Control Director determined that the Selective Catalytic Reduction (SCR) method of controlling air emissions, specifically NO_x emissions, would be required of the proposed Facility. As a result, the predicted NO_x emissions would be decreased by 80% from those originally predicted. The air quality impacts from the proposed Project have been revised to include the new SCR air control method (see Section 4.2, Air Quality).

In the DEIS and the original Air Permit Application to Pinal County Air Quality Control District, Sundance proposed two optional operations configurations. The proposed Facility would either install and operate 12 General Electric LM6000 combustion turbines, or six LM6000 combustion turbines and two General Electric 7FA combustion turbines. Through the air permitting process, Sundance has decided to operate the proposed Facility with the 12 LM6000 combustion turbines. The new air analysis in the amended Section 4.2 only discusses the potential impacts from this configuration.

The DEIS identified three alternative transmission line routes for the interconnection to the Western's transmission lines. The environmentally preferred alternative is Alternative 3, the route furthest to the west.

SUMMARY

Sundance Energy LLC (Sundance) has applied to the Western Area Power Administration (Western) to interconnect a planned generator facility to Western's transmission system in the vicinity of Coolidge, Arizona in Pinal County, southwest of Phoenix. Western's proposed action is to enter into an interconnection and construction agreement with Sundance for the requested interconnection. The proposed interconnection would integrate the power generated by the project into the regional transmission grid and would allow Sundance to supply its power to the competitive electric wholesale market. Western's formal process for determining the availability of transmission capacity for the proposed interconnection is in its preliminary stages. The evaluation of environmental impacts in this EIS is one of these preliminary steps. At this point, it is foreseen that there is enough potential capacity to continue the formal determination process.

Sundance proposes to construct and operate the Sundance Energy Project (Project), a natural gas-fired, simple cycle power plant on private lands southwest of Coolidge. The proposed Project would consist of a nominal 600 megawatt (MW) natural gas fired, simple cycle peaking generating facility and associated infrastructure, newly constructed and upgraded transmission lines, a pipeline to supply additional natural gas, a water supply well, and access roads. Under the No Action Alternative, Western would reject the Sundance application to interconnect to Western's transmission system, and the proposed facility, transmission lines, and pipeline would not be built. Sundance may appeal Western's decision to the Federal Energy Regulatory Commission

This Environmental Impact Statement (EIS) was prepared in accordance with Section 102(2) of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4332, Council of Environmental Quality regulations, and U.S. Department of Energy (DOE) NEPA Implementing Procedures (10 CFR 1021). Western is the lead Federal agency, as defined by 40 CFR 1501.5.

Western will use the information provided in this EIS to support Federal decisions for the proposed Project. Western will decide whether to enter into an interconnection and construction agreement with Sundance and, if approved, the best way to interconnect the proposed Project into the Western transmission system to provide the needed transmission services.

UNDERLYING PURPOSE AND NEED FOR AGENCY ACTION

Sundance is responding to the need to provide additional supply of electricity to the Phoenix metropolitan area and surrounding region during peak demand periods. Reserve margins (generation supply - peak load) have decreased considerably in the region over the past decade. Sundance has a need to make a profit selling its power in the regional wholesale market. Based on these needs, Sundance purposes include siting the proposed Project near existing gas and water supplies, and transportation facilities near the Coolidge Substation, thus interconnecting with the Phoenix 230-kV loop, and away from densely populated residential areas. Sundance purposes also include benefiting Pinal County by increasing the reliability of the local electrical system and using land available at marketable rates.

PURPOSE AND NEED FOR AGENCY ACTION

Western, as a major transmission system owner, must generally provide access to its transmission system when it is requested by an eligible organization per existing policies, regulations and laws. Sundance applied to interconnect its proposed power plant with Western=s transmission line system in the vicinity of Coolidge.

The purposes of the Proposed Action include:

- To meet the requirements of Western=s Open Access Transmission Service Tariff, which is intended to meet the intent Federal Energy Regulatory Commission of (FERC) Order No. 888 in providing non-discriminatory transmission access.

- To provide transmission service and capacity for the proposed Project without degrading service to existing customers.

- To ensure transmission system reliability is maintained.

- To cause the minimum practical adverse environmental effects, consistent with sound land management practices.

Although the Federal action is to decide whether to allow Sundance to interconnect to Western's transmission system, the construction and operation of the proposed Project is a directly connected action. Therefore, this document evaluates the proposed Project as well as the interconnection.

SCOPING

The Notice of Intent to prepare an EIS for the proposed Project was published in the *Federal Register* on September 1, 2000. Comments received on issues to be evaluated in the Sundance Energy Project EIS included: the need for the proposed Project; proposed Project alternatives; public role in decision making; effects on the rural character of the area; routing and height of new transmission lines; and effects on the biological, cultural, water, and visual resources, as well as on air quality and noise. These issues are included in the analyses and discussions presented in this EIS. In addition, consultations have been initiated with Federal, state, and local resource management and regulatory agencies as well as interested tribal governments.

PUBLIC COMMENT PROCESS

The Notice of Availability for the Draft Sundance Energy Project EIS was published in the Federal Register on March 23, 2001. A public hearing was held in Coolidge, AZ on the evening of April 12, 2001, where verbal and written comments were collected. Other comments were submitted by mail. The comment period ran through May 7, 2001. A total of 15 commentors made comments on the DEIS and related issues.

These comments were considered and where appropriate, changes to the Draft EIS were made. The comments and responses to the comments were collated into a Comment Response Document, Appendix C. The Comment Response Document, Appendix C, is included in this Final EIS. Table C-1 shows a breakdown of the comments by issue category.

PROPOSED ACTION AND ALTERNATIVES

The proposed Project would consist of the construction and operation of a generating facility (Facility); construction of a 14-mile pipeline to supply natural gas to the proposed Facility; a new 230-kV bay at an existing substation; a new double-circuit 230-kV transmission line; a new single-circuit 230-kV transmission line; an upgrade of a 115-kV line to 230-kV specifications; and an upgrade of an existing substation. Three alternatives would consist of different locations for the 230-kV transmission lines.

NO ACTION ALTERNATIVE

Under the No Action Alternative, Western would not allow Sundance to interconnect with Western's transmission system. Without the ability to interconnect to Western's transmission lines, the proposed Project would not be feasible and would not be built. Sundance may appeal Western's decision to the Federal Energy Regulatory Commission. Upon hearing the appeal FERC may or may not reverse Western's decision.

IMPACTS

Resource areas evaluated for potential impacts include land use, air quality, noise, infrastructure, water resources, geology and soils, biological resources, cultural resources, visual resources, transportation, socioeconomics, and environmental justice. Table S-1 summarizes the environmental consequences of the Proposed Action and alternatives. The most significant resource area impact of the Proposed Action would be visual resources. The proposed Facility's 60- and/or 100-foot tall stacks and 120 foot transmission pole structures would have a strong linear, vertical form that would contrast with the surrounding flat, horizontal landscape. The visual quality impacts of the vertical structures would be minor because the structures would be seen by a relatively small number of residents and travelers. No significant or long-term impacts are expected in other resource areas. Short-term effects would be primarily related to construction activities and would, for the most part, return to normal after construction has been completed.

The Proposed Action would have positive effects on some resource areas including the following:

- The local economy would experience a small boost over the life of the project due to payroll earnings and construction expenditures.

- The assessed value of the Property would increase and result in a substantial increase in property revenues to the local taxing district.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
LAND USE	**Facilities** No long-term impacts to land uses. Minimal impacts related to siting, construction, and operation of the proposed Facility. Short-term impacts would include increased daytime noise and dust during construction. An access road would be constructed on the Property. No disruption to land uses from access road construction. Overall recreation activities would not be significantly affected. Paving a segment of Randolph Road would negatively impact horseback riding along the road, but other unimproved roads in the area could offer enjoyment of equestrian activities. **Pipelines** No permanent disturbance to croplands. Construction on agricultural land would cause temporary loss of crops on the construction right-of-way (ROW) (about 124 acres). A year=s loss of crops could occur along the ROW. Crop yields may be reduced for one to two years following construction. Temporary construction disturbance of about 36 acres of vacant land, 9 acres of industrial land, and 1.2 acres of urban/residential land. Short-term effects would include noise, dust, and traffic detours during construction. Access would be from existing local, county, and state roads. Proposed natural gas line would be compatible with future land use planning. **Transmission Lines** No impacts to existing land status and land uses. Permanent ROW would be affected by the removal of about five acres of vegetation during the installation of tower structures related to ED2 Line upgrades and 0.5 acres between the proposed Facility and Signal Substation. No long-term impacts are expected to other land uses within or adjacent to the new line from the proposed Facility to the Liberty-Coolidge Line. The location of the transmission lines would not change,	No impacts to existing land uses in the area.	**Alternative 1** The amount of land disturbed would be 11.2 acres along the ROW. All other impacts would be similar to impacts for the Proposed Action. **Alternative 2** The same as Alternative 1. **Alternative 3** About 6.8 acres of cropland and 7.2 acres of native vegetation on State Trust land would be disturbed during the installation of structures related to this alternative.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
LAND USE (continued)	therefore, there would be minimal impacts to crop dusting in the area. Short-term effects to residential areas related to construction and operation would include noise, dust, and traffic detours,; obstruction of traffic at road crossings; and maintenance activities including the physical intrusion of crew and equipment on private lands. No impacts to recreational uses.		
AIR QUALITY	**Facilities** Minimal air impacts due to construction and operation of the proposed Facility. Configuration 1 would result in the maximum impact. Maximum annual NO_x and 24-hour PM_{10} concentrations are predicted to occur on the high terrain to the west and northwest of the proposed Facility on the eastern ridges of the Sacaton Mountains. The proposed Facility would be a major PSD source for NO_x and CO. For Configuration 1, the PSD Class II increment consumption in significance area of proposed Facility would be 6 percent of NO_2 PSD Class II increment of 25 Fg/m^3. For Configuration 2, the PSD Class II increment consumption in significance area of proposed Facility would be 11.56 percent of NO_2 PSD Class II increment. Visibility is predicted to decrease five percent one day in the Class I airshed, Superstition Wilderness, in December and March. Acid deposition impacts are predicted at two Class I airsheds, Superstition Wilderness and Saguaro West National Park. **Pipelines** Fugitive dust emission impacts are expected from construction activities along the ROW. Impacts are comparable to current agricultural activities in the area. **Transmission Lines** Fugitive dust emission impacts are expected from construction activities.	No impacts to air quality in the area.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
AIR QUALITY (continued)	Impacts are comparable to current agricultural activities in the area.		
NOISE	**Facilities** The proposed Facility noise levels for the proposed configurations are not expected to exceed 55 dBA. Residences nearest to the 55 dBA noise level could experience increase noise of about 10 dBA above assumed rural background noise level. No blasting is expected during construction. **Pipelines** Noise levels above background (40-45 dBA) during construction. Construction noise would be at one-mile intervals of pipeline construction along the ROW. **Transmission Lines** Noise levels elevated above background during construction. Long-term corona audible noise from transmission lines but this noise is usually lost in background noise beyond the transmission ROW.	No impacts to noise emissions in the area.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.
INFRASTRUCTURE/ WASTE MANAGEMENT	**Facilities** *Electric and Magnetic Field (EMF) Effects* EMF effects are associated with transmission lines. Effects negligible associated with changes to Coolidge and Signal substations. *Infrastructure* No substantial impacts to local area power supplies or natural gas supply. *Waste Management* Potential contamination hazard from the storage and use of fuel, lubricants, and other fluids during construction of plant and access road. No significant effects to municipal solid waste facilities related to the generation of solid waste. **Pipelines** *EMF Effects* Potential for induced currents in pipelines from Western's high voltage lines.	No impacts to infrastructure and waste management.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
INFRASTRUCTURE/ WASTE MANAGEMENT (continued)	*Infrastructure* Natural gas pipeline to only service the proposed Facility. Gas company could potentially decide to extend the pipeline to the northwest, which could increase availability of natural gas in the region. *Waste Management* Potential contamination hazard from the storage and use of fuel, lubricants, and other fluids during construction. Impacts would be minimized by the restriction of refueling activities from dry washes and by requiring immediate cleanup of spills and leaks. **Transmission Lines** *EMF Effects* No significant potential for corona effects and field effects. Magnetic field would be similar to that of common household appliances. Health effects would be similar to those for existing lines. *Infrastructure* No substantial impacts to local power supplies are anticipated. Power requirements expected to be equivalent to an agricultural warehouse or processing plant. *Waste Management* Potential contamination hazard from the storage and use of fuel, lubricants, and other fluids during construction. Impacts would be minimized by the restriction of refueling activities from dry washes and by requiring immediate cleanup of spills and leaks.		

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
WATER RESOURCES	**Facilities** *Surface Water Quantity* No impacts expected from the use of CAP water to other users. The proposed Facility usage expected to help defray operation and maintenance costs of CAP system. *Surface Water Quality* No impacts expected from the extraction of CAP water. Potential contamination from storage and use of fuels, lubricants, fluids, and chemicals during construction and operation. Minimal impacts to drainage patterns are anticipated. *Groundwater Quantity* Minimal impacts to other users are anticipated from groundwater usage. Groundwater pumping is expected to have minimal impact on the Pinal AMA aquifer. No subsidence is anticipated from groundwater pumping. *Groundwater Quality* No impact is expected from construction and operation of the proposed Facility. Potential impacts from potential spills or leaks of fuel, lubricants, fluids, and chemicals during proposed Facility operation. Effluent water quality would be similar to quality of backup water wells. No impacts from use of effluent water for agriculture. No impacts anticipated from blending water prior to agricultural use. **Pipeline** *Surface Water Quantity* Increased runoff is anticipated related to storms and large flow events in disturbed areas. *Surface Water Quality* Potential impacts associated with construction and hydrostatic testing. Potential for increased erosion, sedimentation, turbidity, release of chemical and nutrient pollutants; and	No impacts to surface water or groundwater in the area.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
WATER RESOURCES (continued)	introduction of chemical contamination from fuels and lubricants. No impacts are expected from the use of effluent water for agriculture. *Groundwater Quantity* No impacts are anticipated to groundwater quantity. *Groundwater Quality* Potential impacts from potential spills or leaks of fuel, lubricants, and fluids construction activities. **Transmission Lines** *Surface Water Quantity* No impacts to surface water resources are anticipated related to construction along transmission lines in the area. *Surface Water Quality* Potential impacts from increased sedimentation and turbidity during construction. Potential impacts from accidental spills of fuel, lubricants, and fluids during construction. *Groundwater Quality & Quantity* No groundwater resources would be impacted.		
GEOLOGY AND SOILS	**Facilities** *Geology* Minimal impacts from slope failure and soil erosion. No impacts to sand and gravel availability. Seismic risk is low to moderate. Quick alluvial deposits should be relatively stable. *Soils* Soil erosion impacts are expected to be minor due to minimal rainfall and slopes of less than one percent. **Pipelines** *Geology* Minimal impacts from slope failure. Seismic risk is low to moderate; quick alluvial deposits should be relatively stable.	No impacts to geology and soils in area.	**Alternative 1** The same as the Proposed Action, except about 11.2 acres would be disturbed. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action, except that an additional 14 acres would be disturbed.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
GEOLOGY AND SOILS (continued)	Potential for flash flooding in narrow washes along ROW. *Soils* About 124 acres of prime farmland soils would be disturbed which would alter soil structure and impact productivity. **Transmission Lines** *Geology* Minimal impact on future sand and gravel extraction within the ROW. Minimal risk of rockfalls and landslides. Seismic risk is low to moderate; quick alluvial deposits should be relatively stable. *Soils* About 6.6 acres of prime farmland soils would be disturbed which would alter soil structure and temporarily impact productivity. Minimal impacts from slope failure and soil erosion.		
BIOLOGICAL RESOURCES	**Facilities** *Vegetation and Wildlife* Potential impacts to vegetation and wildlife. Potential loss and/or disturbance of 50 acres of sparsely vegetated native habitats during construction. Potential loss of food, cover, habitats, and/or breeding sites for some species. *Special Status Species* No adverse impacts are anticipated to special status species in Pinal County. **Pipelines** *Vegetation and Wildlife* Potential impacts to vegetation due to the loss and/or disturbance to native plant communities; disturbance of about 124 acres of croplands and loss of 36 acres of sparse native vegetation. *Special Status Species* Potential adverse effects for species known to occur in Pinal County. About 110 acres of mountain plover habitat would be temporarily disturbed. Minimal impact expected due to loss of habitat.	No impacts to biological resources in the area.	**Alternative 1** *Vegetation and Wildlife* Croplands would be eliminated in areas where tower structures would be installed. Croplands would be eliminated in small areas during installation of new structures to reroute the Coolidge-ED2 Line. ***S**pecial Status Species* No impacts would occur. **Alternative 2** Impacts are the same as those in Alternative 1. **Alternative 3** Temporary loss of 7.2 acres of native vegetation. Minimal impacts to wildlife habitat. No impacts to special status species.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
BIOLOGICAL RESOURCES (continued)	**Transmission Lines** *Vegetation and Wildlife* No impacts due to the construction of the four-mile transmission line. *Special Status Species* No impacts would occur.		
CULTURAL RESOURCES	**Facilities** No significant historic properties were found in the proposed Site during previous cultural surveys. Prehistoric artifact scatter was recorded outside the area of potential effect. **Pipelines** Past investigations indicate a low potential for significant historic or prehistoric sites. Previous inventories would be reviewed before construction. Potential disturbances not covered by previous investigations would be inventoried before construction. **Transmission Lines** Inventories have not been completed in the proposed affected area. Inventories would be completed before construction begins. Past inventories in general area indicate a high likelihood for sites along north end of the Signal-Coolidge upgrade. The Signal Switchyard appears less likely to contain significant historic properties.	No impacts to cultural resources in the area.	**Alternative 1** Similar potential to the Proposed Action with the exception of rerouting. Disturbances caused by rerouting the Coolidge-Signal Line from section 19 to the Coolidge Substation and replacement of structures located near areas with a high potential for the presence of potential significant historic and prehistoric resources. These potentially affected areas would be inventoried before construction begins. **Alternative 2** The impacts are the same as Alternative 1. **Alternative 3** The impacts are the same as Alternative 1.
VISUAL RESOURCES	**Facilities** Impacts to visual landscape from the addition of buildings, exhaust stacks, and night lighting when viewed from sensitive viewpoints, travel routes, recreation areas, and residences. **Pipelines** Short-term impacts due to construction and operation of gas pipeline. Short-term impacts due to vegetation removal in the ROW until vegetation has been reestablished in disturbed areas. No impacts to croplands after the ROW has been replanted with crops. **Transmission Lines** Short-term impacts during construction while using local roads. Significant long-term impacts to the landscape from the	No impacts to viewshed in the area.	**Alternative 1** The new one-half mile line constructed between Coolidge-ED2 and Coolidge-Signal lines, and the associated structures would be more visible in the foreground by visitors to Casa Grande National Monument. The structures would not be visible to Casa Grande National Monument at a distance of 2.5 miles. **Alternative 2** The impacts are the same as Alternative 1.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
VISUAL RESOURCES (continued)	installation of pole structures when viewed from sensitive viewpoints and in scenic landscapes. New transmission pole structures from the construction of the new 4.2 and 1.5 mile lines between the proposed Facility and the Signal Substation would be visible to a small number of residents and travelers on nearby county roads. Structures would be visible to a small number of residents and travelers. The nearest locations that a significant number of people would be able to view the structures associated with the construction of the line between Signal Substation and the interconnect with the Liberty-Coolidge Line would be 1.5 miles away in Coolidge and Casa Grande National Monument. No impacts from the upgrade of the line between the interconnection and Coolidge Substation. Transmission line structures would not be visible to visitors at Casa Grande National Monument at a distance of 2.5 miles.		**Alternative 3** The impacts are the same as Alternative 1.
TRANSPORTATION	**Facilities** Access road would be entirely within the Property. Short-term traffic impacts from construction activities and construction traffic are expected at the junction of Randolph Road and the access road. Short-term traffic delays may occur in Coolidge due to the large vehicles delivering equipment. **Pipelines** Short-term construction related traffic impacts at highway crossings. **Transmission Lines** Access to ROW would be from Tweedy Road. Access to existing ROW expected to cause temporary traffic impacts from construction-related traffic stops and lane closures. Access to new ROW would be from existing county roads.	No impacts to traffic and roadways in the area.	**Alternative 1** Traffic related impacts are similar to the Proposed Action minus traffic related to the construction of lines between the proposed Facility and Signal Substation and the Coolidge-ED2 upgrade. **Alternatives 2** Traffic impacts would be the same as Alternative 1. **Alternative 3** Traffic impacts would be similar to Alternative 1 with one exception. Since the new 230-kV lines would not be constructed along Tweedy Road, temporary traffic disruptions along Tweedy Road would not occur.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
SOCIOECONOMICS	**Facilities** Local labor market and economy may be affected. Direct employment of labor related to facility construction and operation. Indirect labor effects related to services provided by support industries. Local economy would be affected by direct project spending and induced economic effects. Minimal effects to public utilities, services, and schools in Coolidge and Phoenix. **Pipelines** Pipeline construction expected to have minimal impact on the economy. Payroll and construction expenditures and property taxes are expected to benefit Pinal County. **Transmission Lines** Construction and operation is expected to have minimal impacts to local economy. Minimal impacts on local emergency services expected. Local area and regional systems are expected to benefit from the increased supply and reliability of power.	No impacts to the local labor market, economy or housing.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.
ENVIRONMENTAL JUSTICE	**Facilities** No impacts to environmental justice from construction and operation of the facility. **Pipelines** No impacts to environmental justice from construction and operation of pipelines. **Transmission Lines** No impacts to environmental justice from construction and operation of transmission lines.	No impacts to environmental justice.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.

3.8 CULTURAL RESOURCES

The current Coolidge Substation, which augmented and replaced the original Coolidge Substation, was initially completed in 1950 as an element of the Davis Dam Project. The new substation was expanded multiple times after 1950, and it became one of the most important power facilities in Arizona in terms of interconnection of the transmission system. However, major alterations were made to the substation beginning in 1964, including the replacement of most of the original equipment. Coolidge Substation is therefore unlikely to retain sufficient integrity of original construction to qualify for eligibility for the National Register of Historic Places (NRHP).

The Coolidge-ED2 transmission line was built in 1950 as an element of the Davis Dam Project. The Coolidge-Signal Line, which runs parallel to the Coolidge-ED2 Line in the proposed Project vicinity, was constructed in 1964 as an element of the Parker Davis Project. Both lines are standard wood pole H-frame transmission lines and deliver power to the ED2 Substation primarily for water pumping and residential purposes. Neither line appears to have particular historical or technological significance that might qualify the line for eligibility for the NRHP.

Signal Substation was completed by the Bureau of Reclamation in 1965 as an element of the Parker Davis Project. The substation was constructed with standard commercial components including 115-kV and 12.47-kV transformers and switching structures. The Liberty-Coolidge 230-kV transmission line was completed by Western in 1987. Signal Substation and the Liberty-Coolidge Line do not appear to have the exceptional significance require for NRHP eligibility of properties that are less than 50 years old.

3.8.1 Facilities

The proposed Facility is on an alluvial plain south of the Gila River at an average elevation of about 1,420 feet above MSL, located at the northwest portion of the Property. The proposed Facility and much of the western end of the Property are previously cultivated land that has been partially reclaimed by native vegetation. Near the center of the western half of the Property is an excavation that appears to have been a borrow pit, and subsequently has been used as a dump for structural debris. The remainder of the Property (roughly three-quarters) is currently in use as cotton and alfalfa fields. Historically, this has been a sparsely settled agricultural area dominated by cotton cultivation, and prehistoric use of the area was likely to have been sparse as well.

A records search at the Arizona State Museum indicated that two archaeological surveys have been conducted within a one-mile radius of the Property (Greystone 2000e). Archaeological survey of the proposed Site recorded only one prehistoric site that is recommended as not eligible for inclusion in the National Register of Historic Places (NRHP) (Slawson 1999). The Class I archaeological survey indicated there are other sites within a mile of the proposed Project (Greystone 2000e, Northland 2001, Slawson 1999). Low-density artifact scatters and isolated occurrences with no associated features were reported. None of the historic or prehistoric materials that may be considered eligible for inclusion in the NRHP are within or close to the proposed Facility (Greystone 2000e).

The proposed Project is within the traditional territories of several tribal groups, and there are Native American communities in the vicinity that maintain aspects of their traditional cultures. In September 2000, the applicant contacted the Gila River Indian Community and the Ak-Chin Indian Community to inform them about the proposed Project. The contact letter also indicated that Western would contact the communities and that Sundance would be interested in tribal participation in archaeological surveys. Sundance has not received any response from the communities. Western has contacted the tribal governments of seven Native American communities that are likely to have traditional concerns in the area to notify them of the proposed Project and solicit any concerns they may have about potential impacts. The Ak-Chin Indian Community, the Gila River Indian Community, the Hopi Tribe, the Pascua Yaqui Tribe, the Salt River Pima-Maricopa Indian Community, the San Carlos Apache Tribe, and the Tohono O'odham Nation have each been consulted by Western on this project.

The Gila River Indian Community, the Tohono O'odham Nation, the Hopi, and the San Carlos Apache have indicated to Western that they have concerns about the proposed Project. Both the Ak Chin and Salt River Pima-Maricopa Indian Communities defer to the Gila River Indian Community in this consultation; the Pascua Yaqui have not yet responded. A representative of the Hopi commented that the entire area around the Gila River is a "middle place" in Hopi legends and is an area of concern to the Hopi people. Archaeological sites are often viewed as proof of oral traditions by the Hopi, and they traditionally interpret archaeological sites as evidence of the Hopis' *Covenant of Natwani*. Because of the importance of archaeological remains to Hopi culture and religion, the Hopi wish to be informed about any disturbances to archaeological materials on the proposed Project. Traditional cultural information is confidential and sensitive, and many tribal representatives are reluctant to divulge information about traditional localities. A lack of response to tribal notification should not be interpreted as a lack of concern or an indication that there are no sensitive localities within the proposed Project area.

An issue of concern to all groups is the possibility of disturbing previously undiscovered human remains. Procedures for consultation with tribal groups regarding unavoidable or unanticipated disturbance of human remains and funerary objects are specified in amendments to the Arizona Antiquities Act (A.R.S. part 41-844). Another issue of potential concern is disturbance of localities or natural features named in traditional stories. Some of these localities also serve as shrine or ritual sites and are currently still in use.

The Casa Grande Ruins are a Traditional Cultural Property to the Hopi, the Gila River Indian Community, the Tohono O'odham Nation and the Ak-Chin Indian Community. The proposed Facility would have no direct impact on these ruins and would not visually intrude on the Property (see Visual Resources, Section 4.9.1.1). The Gila River Indian Community considers other less well known archaeological sites and petroglyph sites in the region as Traditional Cultural Properties, especially those in the Santan and Sacaton Hills. Concern regarding impacts to visibility and use of these areas were expressed and Sundance has addressed these through changes in the proposed Project emissions (see Air Quality, Section 4.2). The proposed Facility will have no direct impact on these Properties.

3.8.2 Pipelines

The proposed pipeline runs from the proposed Facility southwestward about 14 miles and parallel to the El Paso Line 2025 and the El Paso Line 1600 to an interconnect with El Paso Lines 1100 and 1103. The proposed pipeline would pass between the modern towns of Eloy and Casa Grande about two miles southeast of Casa Grande near the north end of the Casa Grande Mountains. Most of the land crossed by this pipeline corridor is under cultivation or has been cultivated at some time in the past. The final three miles from Interstate 8 to the interconnection are largely reclaimed by native vegetation.

The site and inventory cards at the Arizona State Museum were checked and records indicate that eight previous investigations have been conducted within one mile of the proposed pipeline route, and four cultural resource sites have been recorded. Based on the results of the investigations, few significant cultural sites are likely to be found in the proposed Project area (Greystone 2000e). However, 27 irrigation ditches occur within the Project area and their historical significance has yet to be determined. The All American Pipeline was previously surveyed and mitigated for archaeological resources (Ackerly et al. 1989), and has been subject to further archaeological investigation when it was transferred to El Paso Energy Corporation and renamed the Line 2000 (Northland 2000).

3.8.3 Transmission Lines

3.8.3.1 Proposed Action

The proposed new transmission line is along a county road and field margins in the alluvial plain south of the Gila River.

Record searches at the Arizona State Museum for this area indicate that six previous investigations have taken place in the proposed Project vicinity, and that 16 sites have been recorded outside the Casa Grande National Monument. The boundaries of the National Monument encompass the recorded areas for at least 30 separate site numbers. In Class III archaeological surveys of the proposed Signal-Coolidge transmission line and the three proposed alternatives, six previously recorded archaeological sites were identified in areas of potential impact as well as nine newly-identified archaeological sites (Northland 2001). Of these fifteen potentially impacted sites, three sites (AZ AA:2:200, AA:2:30, and U:14:108) are prehistoric habitation or limited activity sites recommended to be eligible for inclusion in the NRHP. Three are prehistoric limited activity sites recommended as potentially eligible for inclusion in the NRHP, and two are historic concrete-lined canal sites believed to be potentially eligible. The remaining seven sites are all historic or modern and are believed to be ineligible for inclusion in the NRHP. Four are historic or modern trash heaps, one is a historic or modern habitation, and two are historic roads that have been improved in the modern era such that they have little historic integrity preserved (Northland 2001). In addition, the proposed transmission line route crosses two large prehistoric (Hohokam) canal systems, the Pinkley Canal and the Casa Grande Canal (Midvale 1963, Northland 2001). Linear dark soil stains were observed during

archaeological survey, and it is recommended that these areas, as well as the areas of previously documented prehistoric canals, be avoided during transmission line construction (Northland 2001).

The Proposed Action would potentially affect sites AZ AA:2:30 and U:14:108 which are both recommended as eligible for inclusion in the NRHP. In addition, the Proposed Action may impact potentially eligible sites: AZ AA:2:203 and AA:2:204 (both prehistoric limited activity sites) and AA:2:130 (Pima Lateral Canal, a historic concrete-lined canal). The Proposed Action may also affect the ineligible historic sites AA:2:127 (Betchel Road) and AA:6:63 (State Route 87).

3.8.3.2 Alternatives 1, 2 and 3

The affected environment of Alternatives 1, 2 and 3 is much the same as that described for the Proposed Action, but somewhat different archaeological sites will be impacted by the various alternatives.

Alternative 1 and Alternative 2 will both potentially affect sites AZ AA:2:30 and U:14:108 which are recommended as eligibile for inclusion in the NRHP. In addition, Alternatives 1 and 2 will potentially impact AA:2:130 which is the potentially NRHP-eligible Pima Lateral historic concrete-lined canal. Alternative 1 and 2 may also affect the ineligible historic sites AA:2:127 (Betchel Road) and AA:6:63 (State Route 87).

Alternative 3 will potentially affect more archaeological sites than the other Alternatives or the Proposed Route. The Alternative 3 Route will potentially affect sites AZ AA:2:200, AA:2:30 and U:14:108 which are all prehistoric sites recommended as eligible for inclusion in the NRHP. In addition, Alternative 3 may impact these potentially eligible sites: AZ AA:2:201, AA:2:129 and AA:2:130 (one prehistoric limited activity site, and two concrete-lined historic canals, the Pima Lateral and the Southside Canal). Alternative 3 may also affect the ineligible historic sites AZ AA:2:207, AA:2:208, AA:2:209, AA:2:210, AA:2:127 (Betchel Road), AA:6:63 (State Route 87) and Field Site 3 (Northland 2001).

4.2 AIR QUALITY

The air quality resource impact analysis consists of evaluating the impacts of criteria and hazardous air pollutant concentrations resulting from construction and operation of the Proposed Action. This is accomplished by using the EPA-recommended ISCST and CALMET/CALPUFF dispersion models to estimate pollutant concentrations and visibility impacts at receptors located within the area of potential effect.

The area of potential effect resulting from construction and operation of the Proposed Action for criteria and hazardous air pollutant concentrations is about 10 kilometers. The area of potential effect for visibility and/or acid deposition impacts includes the designated Class I airsheds at the Superstition Wilderness located about 57 kilometers north-northeast of the site and at the West Saguaro Park located about 75 kilometers south-southeast.

The air quality section discusses the impacts of the construction and operation of the Proposed Action and alternatives on air quality in the area of potential effects. Comparing modeled air pollutant concentrations with Federal and/or Arizona State air quality standards adopted to protect human health and public welfare quantitatively assesses potential air quality effects.

The determination as to whether an impact is significant with respect to criteria and hazardous air pollutant concentrations is determined by adding the maximum modeled air pollutant concentration to the background air pollutant concentration for the respective pollutant. The resulting total is then compared to the Federal and/or Arizona State air quality standard. Pollutant concentrations above the standards are considered significant. Significant impact concentrations for Prevention of Significant Deterioration (PSD) are quantitatively assessed by comparing the Class II increment with modeled pollutant concentrations in the significance area. Consumption of the increment is considered a significant impact. Impacts of air quality related values (AQRV) are evaluated for Class I airsheds located within 100 kilometers of the Proposed Action. A five percent change in extinction (e.g. reduction of visibility) is considered a significant impact.

4.2.1 Facilities

In the DEIS and the original Air Permit Application to Pinal County Air Quality Control District, Sundance Energy reserved the flexibility to either install or operate 12 General Electric LM6000 combustion turbines, or six LM6000 combustion turbines and two General Electric 7FA combustion turbines. A decision has been made to operate the Facility with the 12 LM6000 combustion turbines. The updated site plan diagram is shown in Figure 2-1.

The combustion fuel would be natural gas resulting in emissions of the following criteria pollutants: particulate matter less than 10 microns in diameter (PM_{10}), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), and Volatile Organic Compounds (VOC); and several hazardous air pollutants. Emissions of nitrous oxides (NO_x) result from the combustion process. The regulated pollutant, NO_2, is a portion of the total NO_x emitted. The emissions prepared for the proposed Facility calculate the portion of NO_x emissions that are NO_2. Therefore, references to NO_x actually indicate NO_2.

The ultimate result of the BACT determination by the Pinal County Air Quality District Control Director was that NO_x BACT for the General Electric LM6000 SPRINT combustion turbine is 5.0 parts per million dry volume at 15 percent oxygen (5.0 ppmvd @ 15% O_2). As a result, the NO_x predicted emissions have decreased 80 percent. The addition of the SCR also requires a higher stack. Sundance Energy's new stack height would be 85 feet above grade.

4.2.1.1 Criteria Pollutants

Under the Clean Air Act of 1970 (42 U.S.C. 7401) the EPA has set the National Ambient Air Quality Standards (NAAQS) for several criteria pollutants to protect human health and welfare (40 CFR 50). These criteria pollutants include PM_{10}, SO_2, CO, NO_2, lead (Pb), and ozone (O_3). Primary standards are adopted to protect human health. Secondary standards are adopted to protect public welfare. Arizona has adopted the federal NAAQS as indicated in Table 4-1. Enforcement of these standards is the responsibility of the Pinal County Air Quality Control District (PCAQCD).

Table 4-1
Arizona State and Federal Air Quality Standards

Pollutant	Averaging Time	Primary Standard ppm / µg/m^3	Secondary Standard ppm / µg/m^3
Nitrogen Dioxide (NO_2)	Annual	0.05 / 100	0.05 / 100
Particulate Matter (PM_{10})	24-Hour	NA / 150	NA / 150
	Annual	NA / 50	NA / 50
Carbon Monoxide (CO)	1-Hour	35 / 40,000	--
	8-Hour	9 / 10,000	--
Sulfur Dioxide (SO_2)	Annual	0.03 / 80	--
	24-hour	0.14 / 365	--
	3-hour	--	0.5 / 1,300
Ozone (O_3)	1-Hour	0.12 / 235	0.12 / 235
Lead (Pb)	Calendar Quarter	NA / 1.5	NA / 1.5
Formaldehyde(1)	1-Hour	NA / 20	--
	24-Hour	NA / 12	--
	Annual	NA / 0.08	--

Source: Arizona Department of Environmental Quality (ADEQ)
NA – Not Applicable
(1) Formaldehyde standards are Arizona Air Quality Guidelines and are used for reference, and not regulatory purposes.

Air Quality Dispersion Modeling. The Industrial Source Complex Short Term (ISCST356) dispersion model, dated 98356 (December 20, 1998) was used to predict pollutant concentrations from emissions from the proposed Facility. This model was selected as the most appropriate model to perform the air dispersion modeling analysis from continuous sources because it is designed to support the EPA regulatory modeling program and is capable of handling multiple sources, including different source types. The model estimates pollutant concentrations at receptor locations that in turn are compared with Federal and State regulatory standards to determine compliance.

The model requires turbine emission data, source parameters describing the turbine exhaust, a receptor grid identifying the locations at which the model calculates pollutant concentrations, meteorological data including surface and upper air data, and EPA regulatory default options to calculate conservative pollutant concentrations.

The proposed Facility would be a major source for nitrogen oxides (NO_x) and CO. A new source is major if it has the potential to emit any regulated pollutant in amounts equal to or exceeding 250 tons per year. PM_{10} annual emissions would be above Prevention of Significant Deterioration (PSD) significance levels, so PM_{10} also was included in the air quality analysis. SO_2 emissions would be below PSD significance levels, therefore an air quality analysis is not required for SO_2 (Greystone 2000d).

Emissions. Criteria pollutant emissions from the Sundance Energy Facility consist of startup, shutdown, and steady-state operations. For the purposes of the annual emission analysis, the following operational parameters would occur:

1,000 startup and shutdown sequences

6,500 hours at 100 percent load.

The following sections quantify the estimated annual emissions that would occur under this operational scenario.

Startup Emissions

The General Electric LM6000 SPRINT combustion turbine is capable of a rapid startup sequence to quickly respond to market demands for electrical power generation. However, the warm-up time for the SCR adds considerably to the startup time. According to the data provided by General Electric, the startup time from synchronized idle to base load is four minutes. Emissions from synchronization to full load are:

NO_x: 2.34 lbs / 4 minutes

CO: 0.27 lbs / 4 minutes

VOC: 0.07 lbs / 4 minutes

Emissions from initial fire to synchronization, a period of two minutes, are estimated to be 10 percent of the emissions from synchronization to full. Therefore, the total startup sequence emissions (without an SCR) are as follows:

NOx: (2.34 lbs * 1.1) = 2.57 lbs for 6 minutes

CO: (0.27 lbs * 1.1) = 0.297 lbs for 6 minutes

VOC: (0.07 lbs * 1.1) = 0.077 lbs for 6 minutes

At this point, the turbine is operating at its design capacity, and emissions are controlled by water injection to 25 ppmvd NO_x. An additional phase in the startup sequence is then required for the

temperature of the SCR catalyst bed to increase to an operational range. During this phase, lasting approximately 24 minutes, ammonia cannot be injected upstream of the catalyst bed because the ammonia would not react with NO_x, but would react with trace sulfur quantities to form ammonium salts. This chemical reaction can permanently and irreversibly damage the reactivity of the SCR catalyst. Therefore, during this 24-minute period, NO_x and other emissions reflect control by water injection.

The LM6000 emissions vary with ambient temperature when operating at 100 percent load. At 25 ppm NO_x emissions range from 37.1 lbs/hr at 115°F, 40.1 lbs/hr at 59°F, and 41.2 lbs/hr at 20°F. CO emissions range from 30.0 lbs/hr at 115°F, 72.8 lbs/hr at 59°F, to 131.8 lbs/hr at 20°F. VOC emissions range from 4.0 lbs/hr at 115°F, 4.3 lbs/hr at 59°F, to 4.5 lbs/hr at 20°F. Therefore, total startup emissions are calculated as follows:

NO_x: 2.57 lbs (for 6 minutes) + 24 minutes at 40.1 lbs/hr = 2.57 + 16.04 = 18.61 lbs

CO: 0.297 lbs for 6 minutes + 24 minutes at 72.8 lbs/hr = 0.297 + 29.12 = 29.42 lbs

VOC: 0.077 lbs for 6 minutes + 24 minutes at 4.3 lbs/hr = .0077 + 1.72 = 1.80 lbs

Shutdown Emissions

The shutdown sequence would involve turning off the ammonia flow, and then starting the shutdown sequence. Therefore, the time will be six minutes and the total emissions would be equal to the first phase of the startup sequence as follows:

NO_x: 2.57 lbs for 6 minutes

CO: 0.297 lbs for 6 minutes

VOC: 0.07 lbs for 6 minutes

Combined Startup, Shutdown, and 100% Load Emissions

Since a startup/shutdown sequence could occur at any time during the year, the average emissions, i.e., those emissions at the mid-range temperature, are used in this analysis. The most conservative hourly emissions could occur if a startup and shutdown occurred within the same hour. Since the startup sequence would last 30 minutes and the shutdown sequence would last six minutes, 24 minutes would remain for the turbine to operate at 100 percent load. Therefore, the total emissions for any hour of operation in which a GE LM6000 startup/shutdown occurs would be:

NOx: 18.61 lbs [Startup] + 2.57 lbs [Shutdown] + (0.4 hrs * 8.0 lbs/hr) [100% Load] = 24.38 lbs

CO: 29.42 lbs [Startup] + 0.297 lbs [Shutdown] + (0.4 hrs * 72.8 lbs/hr) [100% Load] = 58.84 lbs

VOC: 1.80 lb [Startup] + 0.07 [Shutdown] + (0.4 hrs * 4.3 lbs/hr) [100% Load] = 3.59 lbs

Estimated Facility Emissions

The hourly emissions at 100 percent load are the highest during cold temperatures and the lowest during hot temperatures. The estimated annual emissions are based on the emission factors at 100 percent load and at an ambient temperature 59ºF, near the mean annual temperature of 69ºF recorded at the Casa Grande National Monument, approximately four miles north of the proposed Sundance Energy facility. The annual emissions are based on the mean temperature because the facility may operate at any time during the year. For short-term modeling the higher hourly emission rates at the lower ambient temperature for CO were evaluated.

The PM_{10} emissions represent the "filterable" or "front-half" and the "condensable" or "back-half" PM_{10}. The DEIS and original Air Permit Application listed the estimated PM_{10} emissions as only the "front-half" filterable PM_{10} in accordance with the existing regulatory guidance in Arizona. Subsequently, the State of Arizona Department of Environmental Quality furnished guidance that PM_{10} should contain the total PM_{10}, i.e., the combination of "front-half" filterable and "back-half" condensables. A review of existing literature and emissions documentation shows that the most recently published AP-42, Section 3.1, and Emission Factors for Stationary Gas turbines (EPA 2000), PM_{10} (front-half and back-half) emission factor is 6.76 lbs/MMscf. LM6000 turbine performance data indicates an annual average high heating value of 434 MMBtu/hr. At 999 MMBtu/MMscf, the average fuel usage would be 0.434 MMscf/hr. Therefore, total particulate emissions using the EPA AP-42 emission factor are predicted to be 2.93 lbs/hr. Since this factor has not been measured for each and every type and size of combustion turbine, plus the inherent ranges of measured data, conservative estimate of total PM_{10} is to at least double this emission factor. Sundance Energy is therefore submitting 7.0 lbs/hr as a good-faith estimate of total PM_{10} emissions.

Table 4-2 verifies the expected emissions rates both in terms of lbs/hr and ppmvd @ 15% O_2.

Table 4-3 summarizes the estimated annual emissions based on the following:

- emission rates at the annual average temperature
- 6,500 hours at 100% load
- 1,000 hours when a startup and shutdown occurs

Table 4-2
Sundance Energy Estimated Hourly Emissions

	115°F 10%Relative Humidity		59°F 40% Relative Humidity		20°F 60% Relative Humidity	
Pollutant	lbs/hr	ppmvd@15% O_2	lbs/hr	ppmvd@15% O_2	lbs/hr	ppmvd@15% O_2
NO_x	7.4	5.0	8.0	5.0	8.2	5.0
CO	24.8	28.2	72.8	76.4	131.8	134.6
PM_{10}	7.0	NA	7.0	NA	7.0	NA
VOC	4.0	8.0	4.3	8.0	4.5	8.1
SO_2	0.8	NA	0.9	NA	0.9	NA

Table 4-3
Sundance Energy Estimated Annual Emissions
12 GE LM6000 Sprint Combustion Turbines
With Selective Catalytic Reduction

NO_x		**CO**		**PM_{10}**		**SO_2**		**VOC**	
Average Hourly Emissions per unit	**Annual Total (12 units)**	**Average Hourly Emissions per unit**	**Annual Total (12 units)**	**Average Hourly Emissions per unit**	**Annual Total (12 units)**	**Average Hourly Emissions per unit**	**Annual Total (12 units)**	**Average Hourly Emissions per unit**	**Annual Total (12 units)**
lbs/hr	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
Operating 6,500 Hours per Year at 100% Load									
8.02	312.78	72.8	2839.2	7.0	273.0	0.9	35.1	4.3	167.7
1,000 Hours per Year at 100% Load Including a Startup/Shutdown									
24.38	146.28	58.84	353.04	10.0	42.0	0.9	5.4	3.59	21.54
Annual Total	**459**		**3192**		**313**		**40**		**189**

Maximum emission rates for each of the regulatory averaging periods (1-hour, 8-hour, 24-hour, and annual) are used as input into the ISCST dispersion model to perform the dispersion analysis. The resultant maximum emission rates are shown in Table 4-4.

Source Parameters. Source parameters define the physical attributes of the exhaust from each turbine. Table 4-5 presents the source parameters used in the ISCST dispersion model.

Receptor Grid. The receptors are the locations at which the ISCST model calculates concentrations for each of the pollutants. A receptor grid at 25-meter spacing was placed around the perimeter of the proposed Site. Beyond the proposed Site boundary, additional receptors were located at 100-meter intervals out to three kilometers beyond the proposed Site boundary and at 200-meter intervals from three to 10 kilometers. Extra receptors were located in the high terrain area west to northwest of the proposed Site at 200-meter intervals.

Table 4-4
Sundance Energy Dispersion Modeling Emission Rates

Pollutant	Averaging Period	Emission Rate for each LM6000 (grams/second)
NO_x	Annual	1.101
	1-Hour	16.98
CO	8-Hour	16.98
	24-Hour	0.883
PM_{10}	Annual	0.756

Table 4-5
Sundance Energy Stack and Exhaust Modeling Parameters

Stack Parameter	LM6000 SPRINT
Stack height (meters)	25.9
Stack diameter (meters)	3.20
Exit velocity (meter/second)	34.5
Gas temperature (°Kelvin)	728

Meteorological Data. Permit regulations require the use of one year of onsite meteorological data or five years of validated data considered representative of the project location. One year of onsite data were not available, and, therefore, National Weather Service (NWS) data from Tucson, Arizona are used for model inputs. Five full years of EPA validated data was obtained for Tucson along with the upper air data from Tucson for the same period. Although Tucson is about 50 miles from the proposed Facility, the Tucson data are considered the best available and most accurate data to fully characterize the atmospheric parameters that control the dispersion of pollutants from a stationary source such as the proposed Facility.

The PCAQCD requested an evaluation of two additional sources of other wind data. The Arizona Meteorological Network (AZMET) is part of the Extension Biometeorology Program, which is a service of the University of Arizona Cooperative Extension within the College of Agriculture, collects data 3.5 miles north-northwest of the proposed Facility. Although the Coolidge AZMET data contained nearly continuous data, it was rejected for regulatory purposes. EPA regulations dictate that the wind data must be collected at a 33 feet height to partially avoid the effects of the surface features on the wind velocity and to approximate an elevation near the top of the exhaust stack where the pollutants are exhausted to the atmosphere. However, the AZMET wind data are collected at a height of 10 feet for agricultural purposes and therefore is not acceptable for PSD permitting purposes because the wind is not recorded at a height of 10 feet above the ground. The other data source was a one-year period from July 1999 to July 2000 collected at the Casa Grande Municipal Airport. Although the data are accurately collected and validated by the

PCAQCD, it is not as valid as the five-year Tucson data for the following reasons. First, the monitoring location is 15 miles west of the proposed Facility and therefore cannot be considered as onsite data. Since the PSD rules indicate that five years of data should be used, the Casa Grande data cannot be used for this PSD permit because only one year of data is available.

The ISCST model was run using the five years of meteorological data as input to estimate pollutant concentrations at receptor grid locations. The maximum concentration for each of the regulatory averaging periods is used as a conservative estimate of the pollutant concentrations from the proposed Facility.

Model Assumptions. The ISCST model assumptions are the EPA regulatory default options as follows:

- Stack tip downwash
- Final plume rise
- Buoyancy induced dispersion
- Calm processing
- Default wind profile exponents (rural) = 0.07, 0.07, 0.10, 0.15, 0.35, 0.55
- Default vertical temperature gradients = 0.0, 0.0, 0.0, 0.0, 0.02, 0.035
- Anemometer height = 10 meters

In addition, building wake effects were included in the modeling parameters in order to account for the influence of structures and buildings on the turbine exhaust plume.

ISCST Model Results. The results of the analysis are shown in Table 4-6 for each of the five years of meteorological data. The maximum annual and 24-hour impacts are predicted to occur on the high terrain northwest of the Facility on the eastern ridge of the Socaton Mountains. Modeled concentrations on Coolidge, as well as other surrounding areas generally at the same elevation as the proposed Facility, are predicted to be generally at levels less than one percent of all applicable ambient air quality standards.

Table 4-7 presents the maximum pollutant concentrations from the proposed Facility emissions as well as the maximum concentrations from monitoring locations in the surrounding community, labeled as background concentrations. The monitoring data are the best available source of criteria pollutant concentrations representing background conditions although dominated by traffic sources not present at the proposed Facility. In addition, the maximum predicted pollutant concentrations from the proposed Facility do not occur at the locations of the monitoring locations, thereby presenting a very conservative estimate of total criteria pollutant concentrations. The maximum percent of a regulatory standard is 81.1 percent for the combined proposed Facility and background concentrations for PM_{10} for the annual averaging period. This result is dominated by background concentrations measured at the monitoring station in Coolidge and not from concentrations predicted from proposed Facility emissions. In fact, the predicted Facility concentrations are less than two percent of the total annual PM_{10} concentrations.

Table 4-6
Sundance Energy Predicted Air Quality Impact

Pollutant	Averaging Period	Year of Meteorological Data				
		1987	1988	1989	1990	1991
NO_2	Annual	1.40	1.07	0.91	1.06	1.09
CO	1 hour	525	373	373	373	372
	8 hour	200	181	170	179	180
PM10	24 hour	3.86	4.74	3.30	3.65	3.26
	Annual	0.93	0.72	0.61	0.70	0.73

Table 4-7
Sundance Energy Predicted Maximum Air Quality Impacts
12 LM6000 CTs

Pollutant	Averaging Period	Ambient Standard ($\mu g/m^3$)	Maximum Facility Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Percent of Ambient Air Quality Standard
NO_2	Annual	100	1.40	58.5	59.9	59.9
CO	1 hour	40,000	525	1,710	2,235	5.6
	8 hour	10,000	200	1,482	1,682	16.8
PM_{10}	24 hour	150	4.74	83.6	88.34	58.9
	Annual	50	0.93	39.6	40.53	81.1

Hazardous Air Pollutants. Hazardous Air Pollutants (HAPS) were calculated using the AP-42 document Emission Factors for Stationary Sources, Volume I (AP-42), April 2000 (EPA 2000). Emission factors for stationary gas turbines are found in Section 3.1, Stationary gas Turbines, at the following EPA Internet site: www.epa.gov/ttn/chief/ap42/ch03/final/c03s01/c03s01.pdf. With the exception of formaldehyde, all AP-42 emission factors for HAPS from stationary gas turbines were used.

HAPS emissions were originally calculated using the California Air Resource Board California Air Toxics Emissions Factor Database (CATEP). However, subsequent research into this database revealed that emission factors for formaldehyde were 8 to 10 years old. Furthermore, no source data could be obtained from the California Air Resource Board that verified the type or size of the turbines tested, or the operational scenario. Therefore, PPL Global researched other emissions factors.

As part of the issuance of the new Section 3.1 in AP-42, the document "Emission Factor Documentation for AP-42, Section 3.1, Stationary Gas Turbines" was also issued in April, 2000. As part of the document, the author leads the reader to the database that contains all the

applicable data that was used to determine emission factors. This Access database can be downloaded from the EPA CHIEF site at www.epa.gov//ttn/chief/ap42/ch03/related/c03s01.html.

An inspection of this database shows that the formaldehyde emission factor was derived from the testing of 22 turbines (see attached output from database). A more detailed investigation of the data shows that seven of these turbines were General Electric LM aero derivative turbines. Of these seven turbines, only two apply to the Sundance Energy project. Both turbines were LM2500 turbines with water injection generating 20 to 29 MW of power. One turbine had SCR in addition to water injection. The formaldehyde emission factor is reported as 9.87×10^{-05} lb/MMBtu for the turbine with water injection. The emission factor for the turbine with both water injection and SCR was 2.50×10^{-05} lb/MMBtu. Therefore, it can be reasoned that the only available emission factor for aeroderivitive turbines is the maximum of these two factors, or 9.87×10^{-05} lb/MMBtu.

This formaldehyde emission factor is therefore used to calculate annual formaldehyde from the Sundance Energy Facility operating 7,500 hours per year. Based on this actual measured emission factor, the annual Sundance Energy formaldehyde emissions are calculated as follows:

Factor = 9.87×10^{-05} lb/MMBtu

Turbine high heating value (HHV) at annual average temperature = 434 MMBtu/hr

Hourly emissions = Factor * HHV = $9.87 \times 10^{-05} * 434 =$ 0.0428 lb/hr

Annual emissions = (0.0428 lbs/hr * 12 turbines * 7500 hr) / 2000 = 1.93 tons/yr

The Sundance Energy Facility estimated annual HAPS emissions are shown in Table 4-8.

The State of Arizona has established "ambient air quality guidelines" to list ambient concentrations of hazardous air pollutants that would be considerably potentially unhealthy. These guidelines are compared to the maximum predicted ambient concentrations from the Sundance Energy Facility. As shown in Table 4-9, most ambient concentrations are less than one percent of all applicable guidelines. The annual formaldehyde at 7.25 percent of the guideline is the only HAP over one percent of the guideline value.

The SCR process uses an aqueous ammonia solution, less than 20% ammonia and more than 80% water, for NO_x control. Annual ammonia emissions can be quantified by a comparison to the exhaust concentration and molecular weight of NO_x. Ammonia will be emitted at a maximum rate of approximately 10 ppm of the exhaust stream, and NO_x will be emitted at 5 ppm for an annual total of 459 tons. Therefore, the annual ammonia emissions are calculated as:

(Molecular weight NH_3 [17]) / Molecular weight NO_2 [46]) *

(10 ppm NH_3 / 5 ppm NO_2) * 459 tons/year = 339 tons/year ammonia

Table 4-8
Sundance Energy Hazardous Air Pollutants

Substance	CAS	Turbine Emission Rate (lbs/MMBtu) [1]	Hourly Emissions per Turbine (lbs) [1]	Annual Facility Emissions (tons) [2]
1,3-Butadiene	106-99-0	$4.3x10^{-7}$	0.0002	0.01
Acetaldehyde	75-07-0	$4.0x10^{-5}$	0.0174	0.78
Acrolein	107-02-8	$6.4x10^{-6}$	0.0028	0.12
Benzene	71-43-2	$1.2x10^{-5}$	0.0052	0.23
Formaldehyde	50-00-0	$9.87x10^{-5}$	0.0438	1.93
Naphthalene	91-20-3	$1.3x10^{-6}$	0.003056	0.03
Propylene Oxide	75-56-9	$2.9x10^{-5}$	0.01256	0.57
Toluene	108-88-3	$1.3x10^{-4}$	0.0564	2.54
Xylene (Total)	1330-20-7	$6.4x10^{-5}$	0.0278	1.25
Total				**7.46**

[1] One LM6000 turbine at 100% load : 434 MMBtu/hr annual average high heating value
[2] 12 LM6000 turbines at 100% load for 7500 hours

Ammonia Ambient Health Risk

The presumptively safe Arizona Department of Health Standards (ADHS) "Ambient Air Quality Guideline" ("AQGL") for ammonia is 140 $\mu g/m^3$ based on a 1-hour exposure. Those AQGL values do not constitute an enforceable limitation, but rather reflect exposure levels that ADHS has declared to be presumptively "safe."

To determine the maximum 1-hour ambient air concentration of ammonia, a comparison is made to the 1-hour modeling of CO for the Sundance Energy since ambient impacts using the same modeling configuration are directly proportional to the emission rate. The maximum 1-hour CO impact was 525 $\mu g/m^3$ with a 1-hour maximum emission rate of 16.987 grams/second from each of the 12 turbines. Based on an annual ammonia emission rate of 339 tons, the 1-hour emission rate would be 0.814 grams/sec for each of the 12 turbines. Therefore, the maximum ground level ammonia ambient concentration would be:

$$(16.987 / 0.814) * 525 = 25.1\ \mu g/m^3$$

The maximum one-hour exposure would be 25.1 $\mu g/m^3$, or 17.9 percent of the exposure level that ADHS has determined to be presumptively “safe”. Since the predicted maximum 1-hour concentration is well below the established health guideline, it can be concluded that ambient ammonia concentrations would not present a hazard to the public health.

Table 4-9
Sundance Energy Predicted HAPS Ambient Impacts

HAP	Averaging Period	AAAG (mg/m^3)	Sundance Predicted Concentration (mg/m^3)	Sundance Percent of AAAG
1,3-Butadiene	1-hour	7.2	0.00073	0.01014
	24-hour	1.9	0.000126	0.006663
	Annual	0.67	0.0000253	0.00378
Acetaldehyde	1-hour	2300	0.0677	0.00294
	24-hour	1400	0.0117	0.00084
	Annual	0.5	0.00235	0.47000
Acrolein	1-hour	6.7	0.0108	0.16119
	24-hour	2.0	0.00187	0.09350
Benzene	1-hour	630	0.0203	0.00322
	24-hour	51	0.00351	0.00688
	Annual	0.14	0.000705	0.50357
Formaldehyde	1-hour	20	0.167	0.83500
	24-hour	12	0.0289	0.24083
	Annual	0.08	0.0058	7.25000
Naphthalene	1-hour	630	0.00220	0.00035
	24-hour	400	0.000381	0.00010
Propylene Oxide	1-hour	1500	0.0491	0.00327
	24-hour	400	0.00849	0.00212
	Annual	2.0	0.00171	0.08550
Toluene	1-hour	4700	0.219	0.00466
	24-hour	3000	0.0381	0.00127
Xylene	1-hour	5500	0.1083	0.00197
	24-hour	3500	0.0187	0.00053

PSD Analysis. The proposed Facility would be a major PSD source for NO_x and CO. A new source is major if it has the potential to emit any regulated pollutant in amounts equal to or exceeding 250 tons per year. The proposed Facility therefore would be subject to the Federal New Source Performance Standards for stationary gas turbines (40CFR Part 60 Subpart GG). Emissions of particulates (PM_{10}) and volatile organic compounds (VOCs) also exceed the PSD significance level and require a PSD review. Table 4-10 presents the PSD significant concentrations for criteria pollutants.

The PCAQCD Code of Regulations Section 2-5-190 states that: "For new major sources and major modifications located in, and which would establish the minor source baseline date, Pinal County, the baseline area shall be the Central Arizona Intrastate Air Quality Control Region, as designated by the Administrator at 40 CFR 81.271 (7/1/93) and comprising Pinal and Gila counties, at least insofar as any portion of that region is designated as attainment or unclassifiable for the pollutant for which the minor source baseline date is established." The baseline area shall also extend to any other air quality control region located in Arizona in which such a source, establishing a minor source baseline date in Pinal County, would have an air quality impact equal to or greater than one microgram per cubic meter (µg/m^3) (annual average) of the pollutant for which the minor source baseline date is established.

Table 4-10
PSD Air Quality Significant Concentrations

Pollutant	Averaging Time	Class II Increment ($\mu g/m^3$)	Significant Impact Concentration ($\mu g/m^3$)	Monitoring de Minimus ($\mu g/m^3$)
NO_2	Annual	25	1	14
CO	1-Hour	NA	2,000	NA
	8-Hour	NA	500	575
PM_{10}	24-Hour	30	5	10
	Annual	17	1	NA

NA – Not Applicable

The proposed Facility NO_x air quality impact area, greater than one $\mu g/m^3$, is a small area on the higher terrain to the west and northwest of the proposed Facility. The NO_2 major source baseline date is established as February 8, 1988.

All significant stationary minor sources of NO_x within 50 kilometers of the Project were analyzed to determine the existing ambient air quality in the area where the proposed Facility impacts exceeded the NO_x significant level of one $\mu g/m^3$. Permit records and emission inventories were obtained from the PCAQCD to determine significant NO_x sources within 50 kilometers of the proposed Facility. All stationary sources with annual NO_x emissions in excess of 10 tons per year were considered to potentially affect the NO_2 increment consumption and were included in the analysis. Table 4-11 lists the sources evaluated in the PSD Class II increment analysis. This is a very conservative approach to an increment consumption analysis because all sources, regardless of whether they began operating before the NO_2 baseline was triggered, were considered in the analysis.

These sources were included with the proposed Facility emissions using the ISCST dispersion model with the 1987 meteorology, for which impacts were the greatest. The results of the analysis indicated that the maximum impact from all sources is predicted to increase to 1.47 $\mu g/m^3$, or 0.07 $\mu g/m^3$ higher than the 1.40 $\mu g/m^3$ modeled for the Sundance Facility only. Therefore, the PSD Class II increment consumption would be 1.47 $\mu g/m^3$, or 5.9 percent of the available increment of 25 $\mu g/m^3$.

Table 4-11
NO_x Sources Evaluated for PSD Class II Increment Consumption Analysis

Source	Location		Elevation (m)	Emissions (gm/sec)	Stack Height (m)	Exhaust Temperature (K)	Exhaust Velocity (m/sec)	Stack Inside Diameter (m)	Distance from Sundance Energy (km)
	UTM E	UTM N							
Abbott Laboratories	426156	3639754	424	0.631	18.3	411	10.7	0.91	19.1
El Paso Casa Grande Compressor Station	400516	3643869	410	6.561	18.3	576	30.7	1.8	44.3
Hexcel Corporation	426715	3638086	421	0.503	5.2	422	3.6	0.43	18.9
Mayville Metal Products	427393	3638297	422	0.484	18.3	411	10.7	0.91	18.2
Recot	425823	3640434	425	0.469	15.2	548	10.9	1.07	19.3
Salt River Sand and Rock	455561	3654945	435	1.468	3.1	795	59.4	0.13	15.6
United Metro	425083	3635752	417	0.432	7.0	400	57.2	0.15	21.2
Owens Corning Corporation	442169	3614302	487	0.616	18.3	411	10.7	0.91	29.4
Reliant Energy	426246	3640691	416	5.4	48.8	351	15.9	5.94	18.8
US West Casa Grande	442962	3696495	457	1.828	7.3	700	36.3	0.31	52.9

Source: Greystone 2000d.

Air Quality Related Values. For PSD sources, potential impacts to air quality and air quality related values must be evaluated if a proposed source is located within 100 kilometers of a designated Class I airshed. Two Class I airsheds are located within 100 kilometers of the proposed Facility. The closest boundary of the U.S. Forest Service Superstition Wilderness is about 57 kilometers north-northeast. The closest boundary of the National Park Service West Saguaro Park is located about 75 kilometers south-southeast. Modeling using the CALMET/CALPUFF dispersion model was performed to predict visibility and deposition impacts at the two Class I areas near the proposed Facility (Greystone 2000d).

Ambient Air Impacts. PSD regulations require an evaluation of a proposed Facility's potential impact on Class I areas. The ISCST356 dispersion model was run using the five years of Tucson data to evaluate NO_x and PM_{10} ambient air concentrations at the U.S. Forest Service Superstition Wilderness and the Saguaro West National Park. The concentrations are then compared to the PSD Class I increments to determine whether significant air quality deterioration would be

predicted to occur. As shown in Table 4-12, the ambient concentration of NO_x and PM_{10} would be less than three percent of allowable increases.

Table 4-12
Sundance Energy Predicted Maximum Air Quality Impacts at Superstition Wilderness and Saguaro West National Park

Pollutant	Averaging Period	Maximum Concentration ($\mu g/m^3$)	Class I Increment ($\mu g/m^3$)	Percent of Class I Increment	Exceeds Class I Increment
NO_2	Annual	0.032	2.5	1.3	NO
PM_{10}	24 hour	0.237	8.0	3.0	NO
	Annual	0.022	4.0	0.6	NO

Visibility. As a result of the decrease in NO_x emissions, the inclusion of total PM_{10} rather than filterable front-half, the quantification of startup and shutdown emissions, and the changed stack height, a reanalysis of potential impacts to Class I areas was completed.

The Class I analysis using the CALPUFF/CALMET dispersion model requires input emission rates based upon the maximum emissions expected in a 24-hour period. To calculate the maximum 24-hour emissions, it is assumed that three startup/shutdown sequences could occur in a 24-hour period.

Since the PM_{10} and SO_2 emissions are identical for startups, shutdown, and steady-state operation, the 24 hours emissions from each LM6000 turbines are simply the hourly rate of 7.0 lbs/hr for PM_{10} and 0.9 lbs/hr for SO_2.

NO_x emissions are calculated in the following manner:

Three hours with a startup/shutdown and 24 minutes 100% load.

NOx: 18.61 lbs [Startup] + 2.57 lbs [Shutdown] + (0.4 hrs * 8.0 lbs/hr) [100% Load] = 24.38 lbs;

Remaining 21 hours at 100% load at 8.0 lbs/hr annual average:

24-hour total = (24.38 lbs/hr * 3 hrs) + (8.0 lbs/hr * 21 hours) = 241.14 lbs/24 hours = 10.05 lbs/hr = 1.267 gm/sec for each turbine or 15.204 gm/sec for 12 turbines.

PM_{10} = 7.0 lbs/hr = 0.882 gm/sec = 10.584 gm/sec for 12 turbines.

SO_2 = 0.9 lbs/hr = 0.114 gm/sec = 1.368 gm/sec for 12 turbines.

The results of the analysis, shown in Table 4-13, demonstrate that the maximum visibility reduction is predicted to be below 5.0 percent. Therefore, according to the procedures developed by the Federal Land Managers (Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report, December 2000), the Sundance Energy Facility will not have an adverse effect on visibility in the Class I areas nearby.

Table 4-13
Visibility Impacts at Class I Areas
Near Sundance Energy

	Maximum 24-Hour Visibility Reduction (%)	
Month	**Superstition Wilderness**	**Saguaro West National Park**
January	2.24	3.13
February	2.62	1.19
March	2.85	0.93
April	1.24	0.32
May	1.06	0.13
June	0.80	0.40
July	1.16	0.12
August	1.67	0.32
September	0.92	0.35
October	0.98	0.30
November	2.36	0.45
December	3.58	2.94

The Pinal County Air Quality Control District requested an additional analysis of potential visibility effects at the BLM Class II airshed Table Top Wilderness. This analysis was completed using the CALPUFF dispersion model in the screening mode. Per FLAG directions, five years of Tucson data were used. The results of the visibility impact analysis are shown in Table 4-14.

Table 4-14
Visibility Impacts at BLM Class II Table Top Wilderness

Modeled Year	**Number 24-Hour Periods When Visibility Reduction Predicted to Exceed 5 Percent**	**Maximum Percentage of Visibility Reduction (%)**
1984	15	7.70
1985	19	7.93
1986	21	7.82
1987	28	8.00
1988	18	8.38

Casa Grande National Monument Impacts. At the request of the National Park Service for both the Sundance Energy PSD/Title V permit application and the Sundance Energy Environmental Impact Statement process, an Air Quality Related Values (AQRV) analysis was performed for the Casa Grande National Monument in Coolidge, approximately four miles north of the Sundance Energy proposed Facility. The analysis was performed using the same CALPUFF/CALMET procedures described for the mandatory PSD AQRV analysis for the Class I Superstition Wilderness and the Saguaro West National Park.

The results of the analysis, shown in Table 4-15, demonstrate that the maximum visibility reduction is predicted to be 7.7 percent for one 24-hour period in February for the full year modeling analysis. Although one 24-period in February exceeded five percent, the next highest 24-hour visibility reduction in February was 2.75 percent. Therefore, according to the procedures developed by the Federal Land Managers (Federal Land Managers' Air Quality

Related Values Workgroup (FLAG) Phase I Report, December 2000), the Sundance Energy Facility will not have an adverse effect on visibility at the Casa Grande National Monument.

Table 4-15
Visibility Impacts at Casa Grande National Monument

Month	Maximum 24-Hour Visibility Reduction (%)
January	2.81
February	7.73 – next highest 2.75
March	3.98
April	3.88
May	4.05
June	2.43
July	1.66
August	2.02
September	3.11
October	1.73
November	2.66
December	3.69

Acid Deposition. Table 4-16 presents the predicted acid deposition (as elemental nitrogen and sulfur) at the two Class I areas. These impacts are related to the dry and wet deposition of nitric acid, NO_3, NO_x, SO_2, and SO_4. In general, wet deposition at the Superstition Wilderness was slightly greater than dry deposition, while at Saguaro West National Park dry deposition was slightly greater than wet deposition (Greystone 2000d).

Table 4-16
Acid Deposition Impacts at Class I Areas

	Superstition Wilderness		Saguaro West National Park	
Month	Average 24-Hour Nitrogen Deposition (kg/hectare/24 hours)	Average 24-Hour Sulfur Deposition (kg/hectare/24 hours)	Average 24-Hour Nitrogen Deposition (kg/hectare/24 hours)	Average 24-Hour Sulfur Deposition (kg/hectare/24 hours)
January	4.47×10^{-4}	3.32×10^{-5}	3.57×10^{-5}	1.50×10^{-6}
February	6.51×10^{-4}	2.66×10^{-5}	3.25×10^{-5}	1.31×10^{-6}
March	9.73×10^{-4}	2.26×10^{-5}	9.16×10^{-5}	3.19×10^{-6}
April	6.13×10^{-4}	1.74×10^{-5}	1.11×10^{-4}	2.80×10^{-6}
May	3.64×10^{-4}	1.09×10^{-5}	3.70×10^{-5}	9.63×10^{-7}
June	3.12×10^{-4}	8.85×10^{-6}	1.79×10^{-4}	4.00×10^{-6}
July	6.51×10^{-4}	2.97×10^{-5}	1.89×10^{-4}	1.90×10^{-5}
August	1.92×10^{-4}	6.41×10^{-5}	1.74×10^{-4}	1.21×10^{-5}
September	4.16×10^{-3}	1.00×10^{-4}	2.81×10^{-4}	2.13×10^{-5}
October	3.94×10^{-4}	1.37×10^{-5}	3.26×10^{-5}	1.14×10^{-6}
November	1.00×10^{-3}	2.13×10^{-5}	7.73×10^{-5}	2.05×10^{-6}
December	5.94×10^{-4}	2.23×10^{-5}	4.28×10^{-5}	3.61×10^{-6}
Annual Monthly Maximum	4.16×10^{-3}	1.00×10^{-4}	2.81×10^{-4}	2.13×10^{-5}

Source: Greystone 2000d.

In addition to a visibility analysis, acid deposition (wet and dry) of sulfur and nitrogen was also calculated at the Casa Grande National Monument using the procedures described in the aforementioned FLAG document. The results of the analysis are shown in Table 4-17.

Table 4-17
Deposition at Casa Grande National Monument

	Maximum 24-Hour Deposition (kilograms/hectare)	
Month	**Nitrogen**	**Sulfur**
January	0.00723	0.00059
February	0.00413	0.00040
March	0.00227	0.00029
April	0.00131	0.00025
May	0.00117	0.00014
June	0.00364	0.00024
July	0.00253	0.00028
August	0.00300	0.00041
September	0.00537	0.00042
October	0.00031	0.00005
November	0.00284	0.00022
December	0.00169	0.00013

Conclusion. Air quality impacts from construction or operation of the proposed Facility would be minimal with respect to criteria and hazardous air pollutants, adding only a small incremental contribution to existing air quality. The average 24-hour PM_{10} increment resulting from facility operation would be 3.16 percent of the regulatory standard, representing the maximum criteria air pollutant contribution from the facility as a percent of the standard. The maximum one-hour exposure of ammonia would be approximately 18 percent of the exposure level that ADHS has determined to be presumptively "safe". The average annual formaldehyde concentration, as measured against Arizona Air Quality Guidelines, would be 7.25 percent of the hazardous pollutant guideline. The maximum PSD Class II increment consumption in the significance area would be 5.9 percent of the NO_2 PSD Class II increment, therefore consuming a minimal portion of the increment. Visibility impacts in the Class I airsheds would be less than five percent.

4.2.2 Pipelines

Fugitive dust emissions would result from construction along the pipeline ROW. Emissions during construction would be associated with land clearing, drilling, excavation, and earth moving. Dust emissions often vary substantially from day to day, depending on the level of activity, the specific operation, and the prevailing meteorological conditions. A large portion of the fugitive dust emissions would result from construction equipment traffic along the ROW. Construction along the ROW would result in dust emissions that may have a temporary adverse impact on the local air quality. These impacts are comparable to the current agricultural activity ongoing in the area.

4.2.3 Transmission Lines

Fugitive dust emissions would result from construction along the transmission line ROW. Emissions during construction would be associated with land clearing, drilling, excavation, and earth moving. Dust emissions often vary substantially from day to day, depending on the level of activity, the specific operation, and the prevailing meteorological conditions. A large portion of the fugitive dust emissions would result from construction equipment traffic along the ROW. Construction along the ROW would result in dust emissions that may have a temporary adverse impact on the local air quality. These impacts are comparable to the current agricultural activity ongoing in the area. As part of the mitigation of transmission line construction impacts, all construction vehicle movement outside the ROW would be restricted to predesignated access, contractor-acquired access or public roads. All requirements of those entities having jurisdiction over air quality matters would be adhered to and any permits need for construction activities would be obtained.

Table 4-17
CAP Water Quality and Predicted Wastewater Quality

	Calcium	Chloride	Copper	Iron	Magnesium	Manganese	Sulfate	TDS
Maximum	74.2	82.0	<0.01	0.11	28.2	0.03	252	560
Predicted Maximum for Wastewater Pond[1]	371.0	410.0	<0.05	0.55	141.0	0.15	1260	2800
Predicted Water Quality in Blended Wastewater[2]	272.1	300.7	<0.04	0.40	103.4	0.11	924.0	2053.3
Groundwater[3]	NA[4]	735	NA	NA	72.0	NA	669	2752
Secondary Drinking Water Maximum Contaminant Levels[5]	None	250	1.0	0.3	None	0.05	250	500

[1] Assumes all constituents from inflow CAP are in 20% volume of RO outflow
[2] Blended water quality based on 2 parts RO water + 1 part CAP water
[3] DEIS, Table 3-4
[4] Not Analyzed
[5] 40 CFR 143.3

4.8 CULTURAL RESOURCES

This section discusses the potential effects of the construction and operation of the proposed Project and alternatives on cultural resources at the proposed Site, transmission lines, and pipeline as well as the surrounding areas. Potential impacts were assessed by evaluating existing cultural resource studies, as well as conducting an additional archaeological survey of previously un-surveyed land for the proposed transmission lines (Northland 2001). Specifically, proposed Site file searches were completed at appropriate institutions (e.g., Arizona State Museum, Arizona State Historic Preservation Office, and Bureau of Land Management) to determine the potential for cultural resources occurring within the proposed Project area. No cultural properties eligible or potentially eligible for inclusion on the NRHP were identified within the proposed Facility area. Western has consulted with seven interested Tribes regarding both the proposed Facility and transmission line routes (see Section 3.8). Prior to any construction, Western would also consult with the State Historic Preservation Office, Advisory Council, and Arizona State Museum to make sure all cultural resources in the proposed Project area are handled appropriately.

Construction of the proposed Site, the transmission lines, and the pipeline (including ROWs and access roads) has the potential to adversely impact cultural resources (prehistoric, historic or modern) or result in their discovery. Avoidance of any known or newly discovered cultural resources is the recommended primary means of mitigation. However, if avoidance is not possible it would be necessary to develop and implement data recovery plans in order to mitigate potential adverse effects. Two large prehistoric (Hohokam) canal systems, the Pinkley Canal and the Casa Grande Canal, as well as numerous historic water delivery systems would be crossed by the proposed transmission lines. Further investigation of the historical significance and the exact locations of these facilities would be determined before construction begins.

Western is required to comply with the following Executive Orders, Executive Order 13007: Protection and Accommodation of Access to Indian Sacred Sites, and Executive Order 13084: Consultation and Coordination With Indian Tribal Governments, in addition to the statutes and regulations listed in Table 5-1 in the Sundance Energy Project DEIS.

4.8.1 Facilities

The proposed Site was surveyed for cultural resources in 1985, 1999 and 2001, and no significant historic properties were found (Greystone 2000e, Slawson 1999).

4.8.2 Pipelines

The proposed pipeline corridor parallels an existing El Paso pipeline and crosses through arid plains away from major rivers. Modern agriculture in this area is maintained by irrigation systems. Any inventories of the existing pipeline ROW would be reviewed, and any areas of potential disturbance that have not been adequately covered by previous investigations would be inventoried prior to construction. Judging from the results of past investigations in the general area, there is a low potential for significant historic or prehistoric sites along the corridor (Greystone 2000e). However, 27 irrigation ditches would be crossed by the proposed pipeline,

and the historical significance of each ditch would need to be determined prior to construction. Plans to avoid adversely impacting any feature determined to be of historical significance would need to be explicitly stated. Mitigation may include detailed historical documentation including date of construction, historical association [person, canal system] and photodocumentation.

The proposed Project would tie into El Paso Natural Gas Company's 2000 Line after it has been converted from oil to a natural gas line pipeline. The El Paso 2000 Line was formerly owned by the All American Pipeline Corporation and was surveyed and mitigated for archaeological impacts on its construction in the 1980s (Ackerly et al. 1989; Northland 2000).

4.8.3 Transmission Lines

The construction of the proposed transmission line also has the potential to impact cultural resources, including significant prehistoric and historic canals, as well as prehistoric habitation and limited activity sites. If possible, transmission line support poles and towers should be place to avoid any known cultural resources. Construction may result in the discovery of previously unidentified cultural resources. If a discovery is made, work at the site of the discovery should stop until it can be evaluated by a professional cultural resource specialist who should then make recommendations regarding the disposition of the discovery. Those recommendations could include avoidance, removal (in the case of human burials), or further investigation (data recovery). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a mitigation plan would be developed in consultation with the SHPO and interested tribes.

4.8.3.1 Proposed Action

An intensive cultural resource inventory has not yet been completed for the proposed transmission lines and associated facilities or for the proposed transmission line upgrades (Northland 2001). The actual areas of disturbance involved in transmission line upgrades are limited in extent and it should be feasible to avoid or limit impact to identified historic or prehistoric properties. The new transmission lines and Signal Substation would likely entail more ground disturbance, but are located in areas containing fewer significant historic properties (Greystone 2000e, Northland 2001). Monitoring of transmission line construction by a trained cultural resource specialist is necessary to avoid impacts to archaeological sites. The Proposed Action could potentially affect sites AZ AA:2:30 and U:14:108 which are both recommended as eligible for inclusion in the NRHP. In addition, the Proposed Action may impact potentially eligible sites: AZ AA:2:203 and AA:2:204 (both prehistoric limited activity sites) and AA:2:130 (Pima Lateral Canal, a historic concrete-lined canal). There is a high potential for the presence of significant prehistoric canals where the Proposed Action passes nearest to Casa Grande Ruins National Monument (Northland 2001). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a mitigation plan would be developed in consultation with the SHPO and interested tribes.

4.8.3.2 Alternative 1

In terms of known cultural resources, Alternative 1 does not differ appreciably from the Proposed Action. Adding a third 230-kV line to the north from the proposed Site may slightly alter the extent of disturbance in some areas, but would not alter where that disturbance may occur. The differences in Alternative 1 in Section 19 are not in an area of currently known historic properties and the anticipated effects are comparable to the Proposed Action. However, Alternative 1 includes a re-routing of the existing Coolidge-Signal 115-kV line from this point in Section 19 to the Coolidge Substation and replacement of existing wooden H-frame structures with double-circuit tubular steel pole structures. The areas of disturbance are near the Gila River and the Casa Grande Ruins National Monument, where there is a high potential for the presence of potentially significant historic and prehistoric cultural resources. There is a high potential for the presence of significant prehistoric canals where Alternative 1 passes nearest to Casa Grande Ruins National Monument (Northland 2001).

Alternative 1 would potentially affect sites AZ AA:2:30 and U:14:108 which are recommended as eligible for inclusion in the NRHP and AA:2:130 which is the potentially NRHP-eligible Pima Lateral historic concrete-lined canal. Alternative 1 may also affect the ineligible historic sites AA:2:127 (Betchel Road) and AA:6:63 (State Route 87) (Northland 2001). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a treatment plan would be developed in consultation with the SHPO and interested tribes.

4.8.3.3 Alternative 2

In terms of potential effects to known or undocumented cultural resources, Alternative 2 is essentially the same as Alternative 1. Both alternatives are estimated to increase surface disturbance by about 34 acres more than the Proposed Action, but this estimate does not include disturbance that can impact cultural resources, such as temporary access, and staging and storage areas. There is a high potential for the presence of significant prehistoric canals where Alternative 2 passes nearest to Casa Grande Ruins National Monument (Northland 2001).

Alternative 2 would potentially affect sites AZ AA:2:30 and U:14:108 which are recommended as eligibile for inclusion in the NRHP and AA:2:130 which is the potentially NRHP-eligible Pima Lateral historic concrete-lined canal. Alternative 2 may also affect the ineligible historic sites AA:2:127 (Betchel Road) and AA:6:63 (State Route 87) (Northland 2001). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a mitigation plan would be developed in consultation with the SHPO and interested tribes.

4.8.3.4 Alternative 3

Shortly after the issuance of the Sundance Energy Project DEIS, Alternative 3 was identified as the preferred routing. Subsequently, pedestrian survey for cultural resources was initiated. Alternative 3 would re-route the existing Coolidge-Signal 115-kV line from this point in Section 19 to the Coolidge Substation and replace existing wooden H-frame structures with double-

circuit tubular steel pole structures. The areas of disturbance are near the Gila River and the Casa Grande Ruins National Monument, where there is a high potential for the presence of potentially significant historic and prehistoric cultural resources. All areas of potential direct or indirect effect would be inventoried for cultural resources, including significant prehistoric canal systems (Northland 2001).

The Alternative 3 Route would potentially affect sites AZ AA:2:200, AA:2:30 and U:14:108 which are all prehistoric sites recommended as eligible for inclusion in the NRHP and potentially eligible sites: AZ AA:2:201, AA:2:129 and AA:2:130 (one prehistoric limited activity site, and two concrete-lined historic canals, the Pima Lateral and the Southside Canal). Alternative 3 may also affect the ineligible historic sites AZ AA:2:207, AA:2:208, AA:2:209, AA:2:210, AA:2:127 (Betchel Road), AA:6:63 (State Route 87) and Field Site 3 (Northland 2001) (Northland 2001). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a mitigation plan would be developed in consultation with the SHPO and interested tribes.

4.13 CUMULATIVE IMPACTS

This section describes the potential cumulative impacts of the Proposed Action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The section includes the methods of analysis and a summary of the cumulative impacts by resource area.

4.13.1 Introduction

The Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of the NEPA define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" [40 Code of Federal Regulations (CFR) Part 1508.7]. The regulations further explain that "cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." The cumulative effects analysis presented in this EIS are based on the potential effects of construction and operation of the proposed Project and the interconnection to Western's transmission system when added to common issues and their effects in the ROIs for each resource resulting from past, present, and reasonably foreseeable future actions.

4.13.2 Methods of Analysis

The cumulative effects were assessed by combining three elements: anticipated activities by Sundance, anticipated activities by Western, and other anticipated projects and activities (primarily in Pinal County). Anticipated proposed Project activities are summarized from the detailed discussions in Chapters 1 through 4. There are no plans to upgrade the Coolidge-Rogers Line in Western's current Ten-Year Plan. However, during negotiations on renewing the lease for the Coolidge-Rogers transmission line across the Gila River Indian Reservation, the potential for upgrades to the line was discussed. In addition, a potential upgrade to the Coolidge-Rogers Line was mentioned, during the scoping meeting for the proposed Project.

It has been determined that an upgrade to the Coolidge-Rogers Line is not needed at this time to provide transmission capacity for the proposed Project. Since the potential upgrade has been the subject of public discussion, the cumulative impacts of an upgrade to the Coolidge-Rogers Line are included below. If, in the future, the upgrade of the 230-kV Coolidge-Rogers Line is again proposed, the proposal would be evaluated through the NEPA compliance process.

Actions by others in the region include the construction and operation of the Reliant Energy Power Plant and the conversion of the former All American pipeline from oil to natural gas. Since construction of the Reliant Energy Power Plant has already begun, the project impacts were included in as part of the Affected Environment evaluated in Chapter 3 of this EIS.

Two other power stations could soon be operating in Pinal County. The Desert Basin Generating Station in Casa Grande, Arizona, is a 563 megawatt natural gas-fired merchant power plant that is scheduled to be producing by the summer of 2001. The Toltec Power Station is a proposed 2,000-megawatt, natural-gas-fired power plant in southern Pinal County. The Toltec Power Station is scheduled to begin generating by the beginning of 2007.

According to the California Energy Commission, there are 18 power plant proposed for southern central Arizona (Maricopa and Pinal counties). Not all of these proposed facilities may be built. The environmental information gathering process for these facilities is mostly in the beginning stages. While these power stations would be required to meet all environmental standards and regulations, the large number of power stations in the two county area could have significant impacts to air quality and water use.

Two of the landowners in the vicinity of the proposed Project area have informed Western of their intentions to develop their land from agricultural use into housing subdivisions. One of the landowners has begun the zoning change process with the Pinal County Board of Supervisors.

4.13.3 Cumulative Impacts by Resource Area

A summary of the cumulative impacts of the Proposed Action and alternatives is shown in Table 4-19.

4.14 UNAVOIDABLE ADVERSE IMPACTS

The construction and operation of the Proposed Action or any of the alternatives would result in some unavoidable adverse impacts. Impacts to residential areas located near the proposed facilities during construction would include increases in daytime noise and fugitive dust, as well as traffic detours. Since these impacts are associated with the construction phase, they are short-term and temporary. Residences closest to the proposed Facility could experience an increase in noise of up to 10 dBA above the measured background noise level from the operation of the proposed Facility. This level of change in sound levels may be perceived as “dramatic” by these residents.

The generation of energy using gas turbines would cause unavoidable emissions of air pollutants that can be considered an adverse impact. Computer modeling shows that maximum concentrations of most pollutants would occur on the high terrain to the west and northwest of the proposed Facility on the eastern ridges or the Sacaton Mountains. However, these concentrations are expected to be well below applicable ambient air quality standards.

Construction and operation of the proposed Facility would result in the generation of small quantities of solid and hazardous wastes that could decrease the life of existing landfills and increase shipments to RCRA-permitted treatment and disposal facilities, respectively.

Construction of the pipeline would adversely impact about 124 acres of prime farmland soils. This would include compaction of these soils and damaging the soil structure during excavation.

In addition, increases in soil erosion could occur as a result of construction of all of the proposed facilities.

Construction and operation of the proposed Facility would cause loss and/or disturbance to existing native plant communities and loss of habitat for terrestrial animal populations. Cultural resources present in the affected areas could be adversely impacted by construction of the proposed Facility. Surveys conducted prior to construction would aid in mitigating these impacts. Affects that can be avoided would be mitigated through data recovery.

Since the view from nearby roads is of cropland and undisturbed areas, the proposed Facility exhaust stacks, either two at 100-foot and six at 60-foot tall or 12 at 60-foot tall, could considered to be an adverse impact on the viewshed to travelers on the nearby roads. The construction of new transmission towers could have a similar effect.

Table 4-19
Cumulative Impacts

Affected Environment	Proposed Action	Other Projects in Area
LAND USE	No long-term impacts related to siting, construction, and operation of the proposed Facility. No impacts to land status and land uses from proposed Facility construction and operation Short-term impacts are increased daytime noise and dust, the presence of crew and equipment and obstruction of traffic at crossings during construction. Access road would be constructed on proposed Site. No disruption to land uses from access road construction. Pipeline construction on agricultural land would cause temporary loss of crops on construction ROW. Crop yields reduced for 1 to 2 years following construction. Short-term affects would include traffic detours during construction. No impacts to existing land status and land uses from transmission line construction and operation. No impacts to recreational uses are expected. Short-term affects would include obstruction of traffic at road crossings and maintenance activities.	**Coolidge-Rogers** Wherever possible, access to each structure and the ROW would be by existing roads and trails. Much of the reconductoring on the line would be built onto the existing line. **All American Pipeline** The conversion of the pipeline from oil to natural gas would not involve new ROW and would not have impacts on land use. **Housing Subdivisions** The rezoning of the land from agricultural to residential could be approved whether or not the proposed Project is implemented. There could be potential conflicts over ROWs as infrastructure in the area is improved.
AIR QUALITY	No significant air quality impacts are expected in the proposed Project area. Emissions of criteria pollutants, PM_{10}, SO_2, CO, NO_2, and VOCs are expected to be negligible and less than one percent of all applicable ambient air quality standards. Hazardous air pollutants from the combustion of natural gas during operation are expected to be below AAAQG. Two visual impacts greater than 5 percent are predicted to occur in the Class I airshed, Superstition Wilderness, in December and March. Acid deposition impacts are predicted at two Class I airsheds, Superstition Wilderness and Saguaro West National Park.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line is expected to have no impacts on air quality. **All American Pipeline** The conversion of the pipeline from oil to natural gas would require the use of new compressor stations along the line. At this time, it is not anticipated that a compressor station would be built in the area. **Housing Subdivisions** If the proposed housing subdivisions were to be built and the proposed Project implemented, there would be more potential receptors for air pollutants from the proposed Facility. Modeling of the air

Table 4-19
Cumulative Impacts (continued)

Affected Environment	Proposed Action	Other Projects in Area
AIR QUALITY (continued)	Fugitive dust emission impacts are expected from pipeline and transmission line construction activities.	impacts shows that stack height precludes much of the impacts from the immediate vicinity of the proposed Facility.
NOISE	Noise emission levels ranging from 93-108 dBA at the source during construction and from 63-85 dBA during operation are expected. Noise level diminishes with distance from the proposed Site. Those residences closest to the proposed Facility could experience an increase in noise from operation of the proposed Facility equivalent to a residential air conditioner at 50 feet. Noise emission levels from pipeline and transmission line construction are expected to range from 40-45 dBA during daytime hours. Construction noise would be at each 1-mile interval of construction.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would involve noise due to construction activities. Activities would not take place at same place or same time as the proposed Project activities. **All American Pipeline** The conversion of the pipeline would involve noise due to construction activities. Activities would not take place at same place or same time as the proposed Project activities. **Housing Subdivisions** Development of some of the nearby parcels of agricultural land into housing subdivisions will have several cumulative noise impacts. The development would likely increase both daytime and nighttime background noise levels whether or not the proposed Project is built. While, there would be more people nearby to experience noise from the proposed Facility, the increase in background noise would make the noise from the proposed Facility relatively less noticeable.
INFRASTRUCTURE/WASTE MANAGEMENT	No substantial impact from the proposed Facility infrastructure to local area power supplies or natural gas supply is anticipated. Potential contamination hazard from the storage and use of fuel, lubricants, and other fluids during construction of the proposed Facility, pipelines, transmission lines, and access road. Impacts would be minimized by the restriction of refueling activities from dry washes and by requiring immediate cleanup of spills and leaks. No significant affects to municipal solid waste facilities related to the generation of solid waste.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would have no impacts to infrastructure or waste management. **All American Pipeline** The conversion of the pipeline would have no impacts to infrastructure or waste management. **Housing Subdivisions** There could be conflict over ROWs for increased infrastructure should the residential areas be constructed.

Table 4-19
Cumulative Impacts (continued)

Affected Environment	Proposed Action	Other Projects in Area
WATER RESOURCES	Minimal impacts to other users are anticipated from groundwater usage by the proposed Facility. Groundwater pumping is expected to have minimal impact on the Pinal AMA aquifer. No subsidence is anticipated from groundwater pumping. No impact to groundwater quality is expected from the proposed Facility construction and operation activities. No impacts from proposed Facility construction and operation are expected to other users of CAP water. The proposed Facility usage is expected to help defray operation and maintenance costs of CAP system. No impacts expected from the extraction of CAP water. Potential contamination from storage and use of fuels, lubricants, fluids, and chemicals during the proposed Facility construction and operation. Increased runoff is anticipated during pipeline and transmission line construction related to storms and large flow events in disturbed areas. Potential for increased erosion, sedimentation, turbidity, release of chemical and nutrient pollutants; and introduction of chemical contamination from fuels and lubricants. No impacts are anticipated from the design of the stormwater disposal dikes due to implementation of SPCC plans. No impacts are expected from the use of effluent water for agriculture.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would not contribute to water usage in the area. There would be no significant impact to the Gila River and the small dry washes even though construction and upgrade of the line would cross the Gila River and the small dry washes. **All American Pipeline** The conversion of the pipeline would not contribute to water usage in the area. Disturbances to surface water are expected to be minimal. **Housing Subdivisions** The water use associated with the future development cannot be predicted. The likely source of the water would be groundwater.
BIOLOGICAL RESOURCES	Minimal impacts to native wash community from the proposed Facility construction and operation are anticipated. Potential loss and/or disturbance of 50 acres of sparse native vegetation during construction. Potential loss of 50 acres of non-game wildlife habitats.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would involve minor temporary disturbances during construction activities.

Table 4-19
Cumulative Impacts (continued)

Affected Environment	Proposed Action	Other Projects in Area
BIOLOGICAL RESOURCES (continued)	Potential impacts from pipeline and transmission line construction to vegetation related to the loss and/or disturbance to native plant communities. No significant adverse impacts to special status species from the proposed Facility, pipeline, and transmission line construction and operation are anticipated to species in Pinal County. Minimal impact expected due to loss of habitat.	**All American Pipeline** The conversion of the pipeline would involve minor temporary disturbances during construction activities. **Housing Subdivisions** The development of housing subdivisions could disturb a large amount of land depending on the size of the development. The land parcels are currently used for agriculture, and therefore the impacts are not expected to be significant.
CULTURAL RESOURCES	No significant impacts on cultural resources are expected from the proposed Facility construction and operation. No significant historic properties were found in the proposed Facility site during previous cultural surveys. Prehistoric artifact scatter was recorded outside the potential affected area. Past investigations indicate a low potential for significant historic or prehistoric sites. Previous inventories would be reviewed before construction begins. Potential disturbances not covered by previous investigations would be inventoried before construction.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line probably would have an impact on cultural resources. **All American Pipeline** The conversion of the pipeline would have no impacts to cultural resources. **Housing Subdivisions** The development of housing subdivisions could disturb a large amount of land depending on the size of the development. No surveys of the parcels have been undertaken, so the potential for disturbance cultural resources is unknown.
VISUAL RESOURCES	Impacts to visual landscape from the addition of buildings, exhaust stacks, and night lighting when viewed from sensitive viewpoints, travel routes, recreation areas, and residences. Short-term impacts due to construction and operation of gas pipeline due to vegetation removal in the ROW, until vegetation has been reestablished in disturbed areas. No impacts to croplands after the ROW has been replanted with crops.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would have no new visual impacts. **All American Pipeline** The conversion of the pipeline would have no new visual impacts. **Housing Subdivisions** Development of some of the nearby parcels of agricultural land into housing subdivisions would have several cumulative effects on visual resources. The proposed

Table 4-19
Cumulative Impacts (continued)

Affected Environment	Proposed Action	Other Projects in Area
VISUAL RESOURCES (continued)	Short-term impacts during construction while using local roads. Significant long-term impacts to the landscape from the installation of pole structures when viewed from sensitive viewpoints and in scenic landscapes, and a small number of residents and travelers on nearby county roads.	development would transform the area from an agricultural vista to a broken agricultural/residential housing view. While, there would be more people nearby to view the stacks and power poles, only those on the nearby edges of the development would be affected. Other residents would see neighboring houses in the foreground.
TRANSPORTATION	Minimal impacts to transportation are expected from the proposed Facility construction and operation. Access road would be entirely within the Site. Short-term traffic impacts are expected at the junction of Randolph Road and the access road by construction activities and construction traffic. Short-term traffic delays may occur in Coolidge due the large vehicles delivering equipment and construction activities. Short-term pipeline construction-related traffic impacts at highway crossings. Access to existing ROW expected to cause temporary traffic impacts from construction-related traffic stops and lane closures.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would involve short-term traffic delays related to large vehicles delivering equipment and construction activities at highway crossings and intersections of local roads with access roads. **All American Pipeline** The conversion of the pipeline would involve short-term traffic delays related to large vehicles delivering equipment and construction activities at highway crossings and intersections of local roads with access roads. **Housing Subdivisions** The development of residential subdivisions could result in more traffic on more numerous and wider paved roads in the vicinity.
SOCIOECONOMICS	Positive impacts on the local economy are expected from the proposed Facility construction and operation. Increased tax revenues are anticipated. Local economy would be affected by direct project spending and induced economic effects. Minimal impacts to public utilities, services, and schools in Coolidge and Phoenix are anticipated. Positive impact anticipated for electricity supply and reliability of regional system.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would have no impacts. **All American Pipeline** The conversion of the pipeline would result in increased availability of natural gas in the area and could increase the potential for development. **Housing Subdivisions** The residential development could increase burdens on schools and other community services. However, the increase to the.

SOCIOECONOMICS (continued)		property tax base should offset these burdens.
ENVIRONMENTAL JUSTICE	No impacts from construction and operation of the proposed Facility are anticipated. No impacts from construction and operation of pipelines are anticipated. No impacts from construction and operation of transmission lines are anticipated.	**Coolidge -Rogers** The potential upgrade and reconductoring of the transmission line would have no environmental justice impacts. **All American Pipeline** The pipeline conversion would have no environmental justice impacts. **Housing Subdivisions** The residential development would have no environmental justice impacts.

5.1 LAWS, REGULATIONS, EXECUTIVE ORDERS, AND DOE ORDERS

The major Federal law, regulations, Executive Orders, and other compliance actions that potentially apply to the proposed Project, depending on the various alternatives, are identified in Table 5-1. There are a number of Federal environmental statutes that address environmental protection, compliance or consultation. In addition, certain environmental requirements have been delegated to State authorities for enforcement and implementation. It is Western's policy to conduct its operations in an environmentally safe manner and in compliance with all applicable statutes, regulations, and standards. Although this chapter does on address pending legislation or future regulations, Western recognizes that the regulatory environment is in transition, and subject to many changes, and that the construction and operation of the proposed Project must be conducted in compliance with all applicable regulations and standards.

5.2 REGULATORY ACTIVITIES

New permits and approvals would be needed before the proposed Project and associated facilities could be constructed. Permits regulate many aspects of facility construction and operations, including the quality of construction, treatment and storage of hazardous waste, and discharges of effluents to the environment. These permits would be obtained as required from appropriate Federal, state, and local agencies. Table 5-2 contains a summary of the primary approvals that would be required to implement the Proposed Action or the alternatives.

5.3 CONSULTATIONS

Certain statutes and regulations require Western to consider consultations with Federal, state, local agencies, and federally recognized Native American groups regarding the potential for the proposed Project to disturb sensitive resources. The needed consultations must occur in a timely manner and are generally required before any land disturbance can begin. Most of these consultations are related to biological, cultural, and Native American resources. Biological resource consultations generally pertain to the potential for activities to disturb sensitive species or habitats. Cultural resource consultations pertain to the potential for destruction of important cultural or archeological sites. Native American consultations are concerned with the potential for disturbance of Native American ancestral sites or traditional practices.

Western has initiated informal consultation with the USFWS regarding Western's need to address effects to proposed, candidate, and listed threatened and/or endangered species (see Letters, Appendix A). Western's determination on whether the proposed Project would adversely affect proposed, candidate or listed species is pending on the completion of the biological assessment.

A Class I cultural resource review of the proposed Project has been completed. Consultations with the State Historic Preservation Officer and affected Tribes would be initiated upon completion of intensive and ethnographic surveys.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Air Resources	Clean Air Act (CAA) As amended	42 USC §§ 7401 et seq.	Environmental Protection Agency (EPA)	Requires sources to meet standards and obtain permits to satisfy: National Ambient Air Quality Standards, State Implementation Plans, Standards of Performance for New Stationary Sources, National Emission Standards for Hazardous Air Pollutants, and Prevention of Significant Deterioration.
	National Ambient Air Quality Standards (NAAQS)/State Implementation Plans	42 USC §§ 7409 et seq.	EPA	Requires compliance with primary and secondary ambient air quality standards governing sulfur dioxide, nitrogen oxide, carbon monoxide, ozone, lead, and particulate matter and emission limits/reduction measures as designated in each state's implementation plan.
	Standards of Performance for New Stationary Sources	42 USC §§ 7411 et seq.	EPA	Establishes control/emission standards and recordkeeping requirements for new or modified sources specifically addressed by a standard.
	National Emission Standards for Hazardous Air Pollutants	42 USC §§ 7412 et seq.	EPA	Requires sources to comply with emission levels of carcinogenic or mutagenic pollutants; may require a preconstruction approval, depending on the process being considered and the level of emissions that will result from the new or modified source.
	Prevention of Significant Deterioration	42 USC §§ 7470 et seq.	EPA	Applies to areas that are in compliance with NAAQS. Requires comprehensive preconstruction review and the application of Best Available Control Technology to major stationary sources (emissions of 100 t/year) and major modifications; requires a preconstruction review of air quality impacts and the issuance of a construction permit from the responsible state agency setting forth emission limitations to protect the Prevention of Significant Deterioration increment.
	Noise Control Act of 1972	42 USC §§ 4901 et seq.	EPA	Requires facilities to maintain noise levels that do not jeopardize the health and safety of the public.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Water Resources	Clean Water Act (CWA)	33 USC §§ 1251 et seq.	EPA	Requires EPA or state-issued permits and compliance with provisions of permits regarding discharge of effluents to surface waters.
	National Pollutant Discharge Elimination System (NPDES) (section 402 of CWA)	33 USC §§ 1342 et seq.	EPA	Requires permit to discharge effluents (pollutants) and stormwaters to surface waters; permit modifications are required if discharge effluents are altered.
	Safe Drinking Water Act (SDWA)	42 USC §§ 300f et seq.	EPA	Requires permits for construction/operation of underground injection wells and subsequent discharging of effluents to ground aquifers.
	Executive Order 11988: Floodplain Management	3 CFR, 1977 Comp., p. 117	Water Resources Council, Federal Emergency Management Agency, Council on Environmental Quality (CEQ)	Requires consultation if project impacts a floodplain.
Hazardous wastes and soil resources	Compliance with Floodplain/ Wetland Environmental Review Requirements	10 CFR 1022	Department of Energy (DOE)	Requires DOE to comply with all applicable floodplain/wetlands environmental review requirements.
	Farmland Protection Policy Act of 1981	7 USC §§ 4201 et seq.	Soil Conservation Service	DOE shall avoid any adverse effects to prime and unique farmlands.
Biological Resources	Bald and Golden Eagle Protection Act	16 USC §§ 668 et seq.	U.S. Fish and Wildlife Service (USFWS)	Consultations should be conducted to determine if any protected birds are found to inhabit the area. If so, DOE must obtain a permit prior to moving any nests due to construction or operation of project facilities.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Biological Resources (continued)	Migratory Bird Treaty Act	16 USC §§ 703 et seq.	USFWS	Requires consultation to determine if there are any impacts on migrating bird populations due to construction or operation of project facilities. If so, DOE will develop mitigation measures to avoid adverse effects.
	Endangered Species Act of 1973	16 USC §§ 1531 et seq.	USFWS/ National Marine Fisheries Service	Requires consultation to identify endangered or threatened species and their habitats, assess DOE impacts thereon, obtain necessary biological opinions, and, if necessary, develop mitigation measures to reduce or eliminate adverse effects of construction or operations.
Cultural Resources	National Historic Preservation Act of 1966, as amended	16 USC §§ 470 et seq.	President's Advisory Council on Historic Preservation	Require DOE to consult with the State Historic Preservation Office (SHPO) prior to construction to ensure that no historical properties will be affected.
	Archaeological and Historical Preservation Act of 1974	16 USC §§ 469 et seq.	Department of the Interior	Requires DOE to obtain authorization for any disturbances of archaeological resources.
	Antiquities Act	16 USC §§ 431-433	Department of the Interior	Requires DOE to comply with all applicable sections of the Act.
	American Indian Religious Freedom Act of 1978	42 USC §§ 1996	Department of the Interior	Requires DOE to consult with local Native American Indian tribes prior to construction to ensure that their religious customs, traditions, and freedoms are preserved.
	Executive Order 11593: Protection and Enhancement of the Cultural Environment	3 CFR 154, 1971-1975 Comp., p. 559	Department of the Interior	Requires DOE to aid in the preservation of historic and archeological data that may be lost during construction activities.
	Executive Order 13007: Protection and Accommodatior of Access to "Indian Sacred Sites"	May 24, 1996	Department of the Interior	Requires DOE to consider the potential impact of its actions on Native American sacred sites, access to sacred sites, or use of sacred sites.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
	Executive Order 13084: Consultation and Coordination With Indian Tribal Governments	May 14, 1998	Department of the Interior	Requires DOE to consult on a government-to-government basis with tribes and Nations
Worker Safety and Health	Occupational Safety and Health Act	5 USC §§ 5108	OSHA	Requires Agencies to comply with all applicable work safety and health legislation (including guidelines of 29 CFR 1960) and prepare, or have available, Material Safety Data Sheets.
Worker Safety and Health (continued)	Hazard Communication Standard	29 CFR 1910.1200	OSHA	Requires DOE to ensure that workers are informed of, and trained to handle all chemical hazards in the DOE workplace.
Other	National Environmental Policy Act	42 USC §§ 4321 et seq.	Council on Environmental Quality (CEQ)	Requires DOE to comply with NEPA implementing procedures in accordance with 10 CFR 1021.
	Toxic Substances Control Act (TSCA)	42 USC §§ 2011	EPA	Requires DOE to comply with inventory reporting requirements and chemical control provisions of TSCA to protect the public from the risks of exposure to chemicals. TSCA imposes strict limitations on use and disposal of polychlorinated biphenyl-contaminated equipment.
	Hazardous Materials Transportation Act	49 USC §§ 1801 et seq.	Department of Transportation (DOT)	Requires DOE to comply with the requirements governing hazardous materials and waste transportation.
	Emergency Planning and Community Right-To-Know Act of 1986	42 USC §§ 11001 et seq.	EPA	Requires the development of emergency response plans and reporting requirements for chemical spills and other emergency releases, and imposes right-to-know reporting requirements covering storage and use of chemicals which are reported in toxic chemical release forms.
	Pollution Prevention Act of 1990	42 USC §§ 11001-11050	EPA	Establishes a national policy that pollution should be reduced at the source and requires a toxic chemical source reduction and

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
				recycling report for an owner or operator of facility required to file an annual toxic chemical release form under section 313 of SARA.
	Objects Affecting the Navigation Space	14 CFR 77	Federal Aviation Administration (FAA)	Provisions of these regulations specify the criteria used by the FAA for determining whether a "Notice of Proposed Construction or Alteration" is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved.
	Proposed Construction and/ or Alteration of Objects that May Affect the Navigation Space	FAA Advisory Circular (AC) No. 70/460-2H	FAA	This circular informs each proponent of a project that could pose an aviation hazard of the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA.
	Obstruction Marking and Lighting	FAA AC No. 70/460-1G	FAA	This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
	Radio Frequency Device, Kits	47 CFR 15.25	Federal Communications Commission (FCC)	Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement.
	Executive Order 12843: Procurement Requirements and Policies for Federal Agencies for Ozone Depleting Substances	April 12, 1993	EPA	Requires Federal agencies to minimize procurement of ozone depleting substances and conform their practices to comply with Title VI of CAA Amendments referencing stratospheric ozone protection and to recognize the increasingly limited availability of Class I substances until final phaseout.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
	Executive Order12856: Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements	August 3, 1993	EPA	Requires Federal agencies to achieve 50-percent reduction of agency's total releases of toxic chemicals to the environment and offsite transfers, to prepare a written facility pollution prevention plan not later than 1995, to publicly report toxic chemicals entering any waste stream from Federal facilities, including any releases to the environment, and to improve local emergency planning, response, and accident notification.
	Executive Order 12873: Federal Acquisition, Recycling, and Waste Prevention	October 20, 1993	EPA	Requires Federal agencies to develop affirmative procurement policies and establishes a shared responsibility between the system program manager and the recycling community to effect use of recycled items for procurement.
	Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	February 11, 1994	EPA	Requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.
	Executive Order 12088: Federal Compliance with Pollution Control Standards	3 CFR, 1978 Comp., p. 243	Office of Management and Budget (OMB)	Requires Federal agency landlords to submit to OMB an annual plan for control of environmental pollution and to consult with EPA and state agencies regarding the best techniques and methods.
	Executive Order 11514: Protection and Enhancement of Environmental Quality	3 CFR, 1966-1970 Comp., p.902	CEQ	Requires Federal agencies to demonstrate leadership in achieving the environmental quality goals of NEPA; provides for DOE consultation with appropriate Federal, state, and local agencies in carrying out their activities as they affect the environment.`

Western has initiated consultations with Federal and State agencies as well as federally recognized Native American groups regarding the potential alternatives for the Sundance Energy proposed Project to disturb sensitive resources. Table 5-3 presents a summary of the consultations initiated by DOE. Appendix A contains copies of the various consultation letters sent by Western to Agencies and Native American groups and the written responses provided by those agencies and groups. All agencies and Native American groups will be provided with a copy of the Draft Sundance Energy EIS. Information from the agencies and Native American groups responses has been incorporated into Chapters 3 and 4 as appropriate.

Table 5-2
Project List of Permits/Approvals

Agency	Permit/Approval
Arizona Corporation Commission (ACC)	Certificate of Environmental Compatibility
Pinal County Air Quality Control District	Air Quality Permits
U.S. Environmental Protection Agency (EPA)	– Prevention of Significant Deterioration (PSD) Permit – Operating Permit – Acid Rain Permit
	Toxic Air Emissions
Arizona Department of Environmental Quality (ADEQ)	Aquifer Protection Permit
ADEQ	Hazardous Waste Permit
ADEQ/EPA	Stormwater Permits
Arizona Department of State Lands	Condemnation by Western
Bureau of Land Management (BLM)	Right-of-way Grant
Arizona Department of Agriculture	Native Plant Permit
Arizona Department of Transportation (ADOT)	Encroachment Permit Crossing Permit Boring Permit Class C Permit
Pinal County	Zoning Approval Industrial Use Permit Excavation/Grading Permit Septic Permit Permit for Temporary Construction Facilities Permit for Temporary Power Building Permits Permit to Build in Roadway
US Fish and Wildlife Service	Concurrence or Biological Opinion
Arizona State Historic Preservation Office	Concurrence or Agreement Document
U.S. Army Corps of Engineers	Nationwide 404 Permit
Arizona State Museum	Cultural Resources Inventory Permit Burial Agreement

Table 5-3
Summary of Consultations Initiated by Western

Subject	DOE Consultation Letter	Agency/Group Response
	Addressed To (Date of Letter)	**From (Date of Response or Last Contact)**
Land Management	Mr. Mike Anable Arizona State Land Department (December 29, 2000)	
Land Management	Jim Anderson Bureau of Land Management (December 29, 2000)	Michael A. Taylor Bureau of Land Management (January 8, 2001)
Native American	Donald Antone Gila River Indian Community (December 20, 2000)	Barnaby Lewis – verbal contact (January 9, 2001)
Biological Resources	Robert Broshid Arizona Game and Fish Department (December 29, 2000)	
Native American	Delia Carlyle Ak-Cin Community (December 20, 2000)	Mr. Jon Shumaker – verbal contact (January 16, 2001)
NEPA	David Farrell Environmental Protectional Agency, Region 9 (December 29, 2000)	
Air Quality	Donald Gabrielson Pinal Air Quality Stationary Sources (December 20, 2000)	
Cultural Resources	James Garrison Arizona State Historic Preservation Officer (December 20, 2000)	
Biological Resources	David L. Harlow U.S Fish and Wildlife Service (October 12, 2000 and November 29, 2000)	David L. Harlow (November 15, 2000 and December 14, 2000)
Biological Resources	Kim Hartwig U.S Fish and Wildlife Service (December 29, 2000)	
State Official	Jane Dee Hull Governor of Arizona (December 20, 2000)	
Native American	Ivan Makil Salt River Pima-Maricopa Indian Community (December 20, 2000)	Mr. Ron Chiago – verbal contact (January 9, 2001)

Table 5-3
Summary of Consultations Initiated by Western

Subject	DOE Consultation Letter	Agency/Group Response
	Addressed To (Date of Letter)	**From (Date of Response or Last Contact)**
Native American	Edward Manuel Tohono O'odham Nation (December 21, 2000)	
Biological Resources	James McGinnis Arizona Department of Agriculture Native Plant & Cultural Resource Protection (October 13, 2000 and November 28, 2000)	James McGinnis (October 20, 2000)
Land Manage-ment	Davis F. Pecusa Bureau of Indian Affairs, Pima Agency (December 29, 2000)	
Biological Resources	Duane Shroufe Arizona Game and Fish Department (October 13, 2000 and November 20, 2000)	State of Arizona Game and Fish Department, Project Evaluation Program, Habitat Branch Heritage Data, (November 12, 2000 and December 20, 2000))
Cultural Resources	Don Spencer Casa Grande National Monument National Park Service (December 29, 2000)	
Native American	Raymond Stanley San Carlos Apache Tribe (December 20, 2000)	Vernelda Grant – verbal contact (January 9, 2001)
Native American	Peter Steere Tohono O'odham Nation (January 30, 2001)	Peter Steere – verbal contact (January 10, 2001)
Native American	Wayne Taylor, Jr. The Hopi Tribe (December 20, 2000)	Leigh Kuwanwisiwma – letter (October 23, 2000) verbal contact (January 18, 2001)
Air Quality	Richard Tobin Arizona Department of Environmental Quality (December 20, 2000)	
Native American	Robert Valencia Pascua Yaqui Tribe of Arizona (January 30, 2001)	Amalia Reyes – verbal contact (January 16, 2001)
Water Resources	Greg Wallace Arizona State Department of Water Resources (December 29, 2000)	

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LIST OF ACRONYMS AND ABBREVIATIONS

AAAQG	Arizona Ambient Air Quality Guidelines
AADT	Annual Average Daily Traffic
ACC	Arizona Corporation Commission
ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
ADHS	Arizona Department of Health Standards
AM	Amplitude Modulation
AMA	Pinal Active Management Area
APP	Aquifer Protection Permit
APS	Arizona Public Service
AQCR	Air Quality Control Region
AQRV	Air Quality Related Values
AZMET	Arizona Meteorological Network
BACT	Best Available Control Technology
BADCT	Best Available Demonstrated Control Technology
BLM	Bureau of Land Management
bsg	below surface grade
CAP	Central Arizona Project
CAS	Chemical Abstract Service
CATEF	California Air Toxics Emission Factors
CAWCD	Central Arizona Water Conservation District
CEQ	Council on Environmental Quality
CO	carbon monoxide
DEIS	Draft Environmental Impact Statement
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation

DSW	Western's Desert Southwest Customer Service Regional Office
ELF-EMF	extremely-low-frequency electric and magnetic field
EIS	Environmental Impact Statement
El Paso	El Paso Natural Gas Company
EMS	Emergency Medical System
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPRI	Electric Power Research Institute
Facility	Generating facility
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FLAG	Federal Land Managers' Air Quality Related Values Workgroup
FM	Frequency modulation
GE	General Electric
GMA	Groundwater Management Act
GR	General Rural
HAP	Hazardous Air Pollutant
HID	Hohokam Irrigation District
IGR	Irrigation Grandfathered Rights
ISCST	Industrial Source Complex Short Term
KOP	Key Observation Point
LCU	lower conglomerate unit
M&I	Municipal and Industrial
MSA	Metropolitan Statistical Area
MSCU	middle silt and clay unit
MSID	Maricopa-Stanfield Irrigation District
MSL	mean sea level
NEIC	National Earthquake Information Center
NEPA	National Environmental Policy Act
NIEHS	National Institute of Environmental Health Sciences
NIOSH	National Institute of Occupational Safety and Health

NRCS	Natural Resource Conservation Service
NWS	National Weather Service
ORV	off-road vehicle
OSC	Oil Spill Contingency
OSHA	Occupational Safety and Health Administration
PAD	Planned Area Development
PCAQCD	Pinal County Air Quality Control District
POC	point(s) of compliance
Project	Sundance Energy Project
PSD	Prevention of Significant Deterioration
RAPID	Research and Public Information Dissemination
RO	Reverse Osmosis
ROI	Region of Influence
ROW	rights-of-way
SCIDD	San Carlos Irrigation and Drainage District
SCR	Selective Catalytic Reduction
SCS	Soil Conservation Service
SIC	Standard Industrial Code
SPCC	Spill Prevention Countermeasure and Control
Tariff	Notice of Final Open Access Transmission Service Tariff
TDS	total dissolved solids
UAU	upper alluvial unit
UR	Urban Ranch Residential
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compounds
Western	Western Area Power Administration
WS	Waters of the State
WUS	Waters of the United States

CHEMICALS AND ABBREVIATIONS

ac-ft	acre foot or acre feet
bcf	billion cubic feet
cf/hr	cubic feet per hour
CO	carbon monoxide
dB	decibel
dBA	weighted sound levels
F	Fahrenheit
gm	gram
gpm	gallons per minute
K	Kelvin
km	kilometer
kV	kilovolt
lbs	pounds
$\mu g/m^3$	microgram per cubic meter
m	meter
mg/L	milligram per liter
MMBtu	million British Thermal Unit
MMscf	million standard cubic feet
mmcf	million cubic feet
MW	megawatt
NO_2	nitrogen dioxide
NO_x	nitrous oxides

O_3	ozone
PM_{10}	particulate matter less than 10 microns in diameter
Pb	lead
ppb	parts per billion
ppm	parts per million
ppmvd	parts per million dry volume
psig	pounds per square inch
SO_2	sulfur dioxide
VOC	volatile organic compounds
yr	year
*m*T	microtesla

CONVERSION CHART

To Convert Into Metric			To Convert Into English		
If You Know	**Multiply By**	**To Get**	**If You Know**	**Multiply By**	**To Get**
Length					
inch	2.54	centimeter	centimeter	0.3937	inch
feet	30.48	centimeter	centimeter	0.0328	feet
feet	0.3048	meter	meter	3.281	feet
yard	0.9144	meter	meter	1.0936	yard
mile	1.60934	kilometer	kilometer	0.62414	mile (Statute)
Area					
square inches	6.4516	square centimeter	square centimeter	0.155	square inch
square feet	0.092903	square meter	square meter	10.7639	square feet
square yard	0.8361	square meter	square meter	1.196	square yard
acre	0.40469	hectare	hectare	2.471	acre
square mile	2.58999	square kilometer	square kilometer	0.3861	square mile
acre-foot	1233.48	cubic meters	cubic meters	0.00081	acre-foot
Volume					
fluid ounce	29.574	milliliter	milliliter	0.0338	fluid ounce
gallon	3.7854	liter	liter	0.26417	gallon
gallon	0.0039	cubic meter	cubic meter	256.14	gallon
cubic feet	0.028317	cubic meter	cubic meter	35.315	cubic feet
cubic yard	0.76455	cubic meter	cubic meter	1.308	cubic yard
Weight					
ounce	28.3495	gram	gram	0.03527	ounce
pound	0.45360	kilogram	kilogram	2.2046	pound
short ton	0.90718	metric ton	metric ton	1.1023	short ton
Force					
dyne	0.00001	newton	newton	100,000	dyne
Temperature					
Fahrenheit	Subtract 32 then multiply by 5/9ths	Celsius	Celsius	Multiply by 9/5ths, then add 32	Fahrenheit

METRIC PREFIXES

Prefix	Symbol	Multiplication Factor
exa-	E	1 000 000 000 000 000 000 = 10^{18}
peta-	P	1 000 000 000 000 000 = 10^{15}
tera-	T	1 000 000 000 000 = 10^{12}
giga-	G	1 000 000 000 = 10^{9}
mega-	M	1 000 000 = 10^{6}
kilo-	k	1 000 = 10^{3}
hecto-	h	l00 = 10^{2}
deka-	da	l0 = 10^{1}
deci-	d	0.1 = 10^{-1}
centi-	c	0.01 = 10^{-2}
milli-	m	0.001 = 10^{-3}
micro-	*m*	0.000 001 = 10^{-6}
nano-	n	0.000 000 001 = 10^{-9}
pico-	p	0.000 000 000 001 = 10^{-12}
femto-	f	0.000 000 000 000 001 = 10^{-15}
atto-	a	0.000 000 000 000 000 001 = 10^{-18}

Acre-foot: The volume of water that will cover an area of 1 acre to a depth of 1 foot (326,000 gallons, 0.5 second foot days, 1,233.5 cubic meters).

Active storage: Storage in a reservoir that is normally used for water development and flood control. Storage above the minimum power pool and below the top of the flood control storage.

Advisory Council on Historic Preservation: A 19-member body appointed to advise the President and Congress in the coordination of actions by Federal agencies on matters relating to historic preservation.

Adjustment provisions: Sales contract provisions for changes in hydrologic resources.

Administrator: The Administrator of the Western Area Power Administration.

Aeolian: Borne, deposited, produced, or eroded by the wind.

Aesthetics: Referring to the perception of beauty.

Affected environment: Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.

Air dispersion modeling: a mathematical simulation, usually computer-generated, of how gases, vapors, or particles disperse into the air.

Air fogging system: During hot weather conditions, the air fogging system cools incoming air to combustion turbines by spraying a fine mist – or a fog – of water in front of the air intakes which in turn increases turbine generating capacity.

Air pollutant: Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare.

Air quality: Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare.

Air Quality Control Region (AQCR): Geographic subdivisions of the United States established to regulate pollution on a region or local level. Some regions span more than one state.

Air Quality Standards: The level of pollutants prescribed by regulation that may not be exceeded during a specified time in a defined area.

Alluvial deposits: Deposits of earth, sand, gravel, and other materials carried by moving surface water deposited at points of weak water flow.

Ambient air: Any unconfined portion of the atmosphere; open air, surrounding air. That portion of the atmosphere, external to buildings, to which the general public has access.

Amperes: Measure of the flow of electric current; source of a magnetic field.

Aquifer: A body of rock or sediment in a formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Archaeological sites (resources): Any location where humans have altered the terrain or discarded artifacts during either prehistoric or historic times.

Archaeology: A scientific approach to the study of human ecology, cultural history, and cultural process.

Artifact: An object produced or shaped by human workmanship of archaeological or historical interest.

Attainment area: An area which the U.S. Environmental Protection Agency (EPA) has designated as being in compliance with one or more of the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. Any area may be in attainment for some pollutants but not for others.

Atmospheric dispersion: The process of air pollutants being dispersed into the atmosphere. This occurs by the wind that carries the pollutants away from their source and by turbulent air motion that results from solar heating of the Earth's surface and air movement over rough terrain and surfaces.

Auxiliary transformer: A backup transformer.

Background noise: The total acoustical and electrical noise from all sources in a measurement system that may interfere with the production, transmission, time averaging, measurement, or recording of an acoustical signal.

Baseload: Within the alternatives, this refers to operating the hydropower system to maximize baseload energy production. Baseload power plants have high capacity factors meaning they operate much of the time.

Bounding: A credible upper limit to consequences or impacts.

Blading: The use of a steel blade or steel fork attachment on a tracked or rubber-tired vehicle that removes vegetation through a combination of pushing and/uplifting motions.

Breaker: A switching device that is capable of closing or interrupting an electrical circuit under over-load or short- circuit conditions as well as under normal load conditions.

Bus: A set of two or more electrical conductors that serve as common connections between load circuits and each of the phases (in alternating current systems) of the source of electric power.

Candidate species: A species of plant or animal for which there is sufficient information to indicate biological vulnerability and threat, and for which proposing to list as "threatened" or "endangered" is or may be appropriate.

Capability: The maximum load that a generator, turbine, transmission circuit, apparatus, station, or system can supply under specified conditions for a given time interval, without exceeding approved limits of temperature and stress.

Capacity: The load for which a generator, turbine, transformer, transmission circuit, apparatus, station, or system is rated. Capacity is also used synonymously with capability.

Carbon monoxide (CO): A colorless, odorless gas that is toxic if breathed in high concentrations over a period of time. It is formed as the product of the incomplete combustion of hydrocarbons (fuel).

Class I, II, and III Areas: Area classifications, defined by the *Clean Air Act*, for which there are established limits to the annual amount of air pollution increase. Class I areas include international parks and certain national parks and wilderness areas; allowable increases in air pollution are very limited. Air pollution increases in Class II areas are less limited, and are least limited in Class III areas. Areas not designated as Class I start out as Class II and may be reclassified up or down by the state, subject to federal requirements.

Clean Air Act (CAA): (42 U.S. Code 7401 et seq.) Establishes (1) national air quality criteria and control techniques (Section 7408); (2) National ambient air quality standards (Section 7409); (3) state implementation plan requirements (Section 4710); (4) federal performance standards for stationary sources (Section 4711); (5) national emission standards for hazardous air pollutants (Section 7412); (6) applicability of CAA to federal facilities (Section 7418), i.e., Federal agency must comply with federal, state, and local requirements respecting control and abatement of air pollution, including permit and other procedural requirements, to the same extent as any person; (7) federal new motor vehicle emission standards (Section 7521); (8) regulations for fuel (Section 7545); (9) aircraft emission standards (Section 7571).

Clean Water Act: (33 U.S. Code 1251 et seq.) Restores and maintains the chemical, physical, and biological integrity of the nation's waters.

Climatology: The science that deals with climates and investigates their phenomena and causes.

Code of Federal Regulations (CFR): All Federal regulations in force are published in codified form in the Code of Federal Regulations.

Combined-Cycle Generation Facility The combination of a gas turbine and a steam turbine in an electric generation plant. The waste heat from the gas turbine provides the heat energy for the steam turbine.

Combustion turbine: Turbine operating on fuels that are capable of converting heat energy into electrical energy.

Community (biotic): All plants and animals occupying a specific area under relatively similar conditions.

Compressor: A machine, especially a pump, for compressing air, gas, etc.

Conservation: A reduction in electric power consumption as a result of increases in the efficiency of energy use, production, or distribution.

Consumptive water use: The difference in the volume of water withdrawn from a body of water and the amount released back into the body of water.

Corona effect: Electrical breakdown of air into charged particles. It is caused by the electric field at the surface of conductors.

Council on Environmental Quality (CEQ): Established by the *National Environmental Policy Act* (NEPA), the CEQ consists of three members appointed by the President. A CEQ regulation (Title 40 Code of Federal Regulations [CFR] 1500-1508, as of July 1, 1986) describes the process for implementing NEPA, including preparation of environmental assessments and environmental impacts statements, and the timing and extent of public participation.

Criteria pollutants: An air pollutant that is regulated by the National Ambient Air Quality Standards (NAAQS). The U.S. Environmental Protection Agency (EPA) must describe the characteristics and potential health and welfare effects that form the basis for setting or revising the standard for each regulated pollutant. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter.

Critical habitat: Defined in the Endangered Species Act of 1973 as "specific areas within the geographical area occupied by [an endangered or threatened] species..., essential to the conservation of the species and which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species... that are essential for the conservation of the species."

Cultural resources: Districts, sites, structures, and objects and evidence of some importance to a culture, a subculture, or a community for scientific, traditional, religious, and other reasons. These resources and relevant environmental data are important for describing and reconstructing past lifeways, for interpreting human behavior, and for predicting future courses of cultural development.

Cumulative impact: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Customer: Any entity or entities purchasing power from the power generator or distributor provider.

Decibel (dB): A unit for expressing the relative intensity of sounds on a logarithmic scale from zero for the average least perceptible sound to about 130 for the average level at which sound causes pain to humans. For traffic and industrial noise measurements, the A-weighted decibel (dBA), a frequency-weighted noise unit, is widely used. The A-weighted decibel scale corresponds approximately to the frequency response of the human ear and thus correlates well with loudness.

Demand: The rate at which energy is used at a given instant or averaged over a designated period of time.

Demineralization: To remove minerals, as salt, from water.

Deposition: In geology, the laying down of potential rock-forming materials; sedimentation. In atmospheric transport, the settling out on ground and building surfaces of atmospheric aerosols and particles ("dry deposition") or their removal from the air to the ground by precipitation ("wet deposition" or "rainout").

Discharge: The volume of water released from a dam or powerhouse at a given time, usually expressed as cubic feet per second.

Distance zones: The relative visibility from travel routes or observation points.

Double-circuit: Two sets of lines (circuits) on a single tower (a single circuit consists of three conductors).

Drainage basin: An aboveground area that supplies the water to a particular stream.

Drawdown: The height difference between the natural water level in a formation and the reduced water level in the formation caused by the withdrawal of groundwater.

Drinking water standards: The prescribed level of constituents or characteristics in a drinking water supply that cannot be exceeded legally.

Ecology: A branch of science dealing with the interrelationships of living organisms with one another and with their nonliving environment.

Ecosystem: Living organisms and their nonliving (abiotic) environment functioning together as a community.

Effects: As used in NEPA documentation, the terms effects and impacts are synonymous. Effects can be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

Effluent: A waste stream flowing into the atmosphere, surface water, ground water, or soil. Most frequently the term applies to wastes discharged to surface waters.

Elevation: Height in feet above sea level.

Eligibility: The criteria of significance in American history, architecture, archeology, engineering, and culture. The criteria require integrity and association with lives or events, distinctiveness for any of a variety of reasons, or importance because of information the property does or could hold.

Eligible cultural resource: A cultural resource that has been evaluated and reviewed by an agency and the State Historic Preservation Office(r) and recommended as eligible for inclusion in the National Register of Historic Places, based on the criteria of significance.

Emissions: Pollution discharged into the atmosphere from smoke stacks, other vents, and surface areas of commercial or industrial facilities, residential chimneys, and vehicle exhausts.

Emission Standards: Requirements established by a state, local government, or the U.S. Environmental Protection Agency (EPA) Administrator that limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.

Endangered Species: Plants or animals that are in danger of extinction through all or a significant portion of their ranges and that have been listed as endangered by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act and its implementing regulations (50 CFR 424). *Note: Some states also list species as endangered. Thus, in certain cases a state definition would also be appropriate*.

Endangered Species Act: (16 U.S. Code 1531 et seq.) Provides for listing and protection of animal and plant species identified as in danger, or likely to be in danger, or extinction throughout all or a significant portion of their range. Section 7 places strict requirements on federal agencies to protect listed species.

Environmental Impact Statement: The detailed written statement that is required by section 102(2)(C) of the National Environmental Policy Act (NEPA) for a proposed major Federal action significantly affecting the quality of the human environment. A DOE EIS is prepared in accordance with applicable requirements of the Council on Environmental Quality NEPA regulations in 40 CFR Parts 1500-1508, and the Department of Energy NEPA regulations in 10 CFR Part 1021.

Environmental Justice: An identification of potential disproportionately high and adverse impacts on low-income and/or minority populations that may result from proposed federal actions (required by Executive Order 12898).

Energy: That which does or is capable of doing work. It is measured in terms of the work it is capable of doing; electric energy is usually measured in kilowatt-hours.

Ephemeral stream: A stream that flows only after a period of heavy precipitation.

Erosion: Wearing away of soil and rock by weathering and the actions of surface water, wind, and underground water.

Ethnographic: Information about cultural beliefs and practices.

Executive Order 12898: Issued by the President on February 11, 1994, this Executive Order requires federal agencies to develop implementation strategies, identify low-income and minority populations that may be disproportionately impacted by proposed federal actions, and solicit the participation of low-income and minority populations.

Facility: The power generating components of the natural gas-fired, simple cycle peaking power plant.

Fault: A fracture or a zone of fractures within a rock formation along which vertical, horizontal, or transverse slippage has occurred. A normal fault occurs when the hanging wall has been depressed in relation to the footwall. A reverse fault occurs when the hanging wall has been raised in relation to the footwall.

Federal Energy Regulatory Commission: An agency in the U.S. Department of Energy that regulates interstate transfers of electrical energy, certificates for natural gas pipelines, resource development, and other energy actions.

Field effect: Induced currents and voltages as well as related effects that might occur as a result of electric and magnetic fields at ground level.

Floodplain: The lowlands adjoining inland and coastal waters and relatively flat areas, including at a minimum that area inundated by a 1-percent or greater chance flood in any given year. The base floodplain is defined as the 100-year (1.0 percent) floodplain. The critical action floodplain is defined as the 500-year (0.2 percent) floodplain.

Flow: The volume of water passing a given point per unit of time. Same as streamflow.

Formation: In geology, the primary unit of formal stratigraphic mapping or description. Most formations possess certain distinctive features.

General Rural (GR) Zone: The General Rural (GR) Regulatory Zone is intended to identify areas that are: (1) remote and will have no or very low density development (i.e. 1 dwelling unit per 40 acres), (2) in transition from rural to suburban or urban densities on the urban fringe, and (3) remote but where unique developments may occur (e.g. destination resorts, conference centers, etc.). This regulatory zone identifies areas that may have one or more of the following characteristics:

(a) Floodplains. The parcel or area is within the 100-year floodplain identified on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) or, where these maps are unavailable, is within other potential floodplain areas identified by the Washoe County Department of Community Development.

(b) Potential Wetlands. The parcel or area is within a "potential wetland area" as identified by the U.S. Army Corps of Engineers (COE) or, where COE maps are unavailable, is within other potential wetland areas identified by the Washoe County Department of Community Development.

(c) Slopes. The parcel or area has moderate slopes (between 15 and 30 percent) or steep slopes (30 percent or steeper) based on interpretation of the topographic information on the USGS maps for Washoe County.

(d) Public Ownership. The parcel or area is under public ownership.

(e) Remote Location Lacking Infrastructure. The parcel or area is in a remote location that does not have public infrastructure adjacent to or near the site.

Generating unit: The combination of generator and step-up transformer.

Generation: The act or process of producing electricity from other forms of energy.

Generator: A machine that converts mechanical energy into electrical energy.

Groundwater: Water within the earth that supplies wells and springs.

Groundwater basin: Subsurface structure having the character of a basin with respect to collection, retention, and outflow of water.

Hazardous Air Pollutants: Air pollutants that are not covered by ambient air quality standards, but that may present a threat of adverse human health effects or adverse environmental effects.

Hazardous waste: A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20 through 40 CFR 261.24 (i.e., ignitability, corrosivity, reactivity, or toxicity) or be specifically listed by the Environmental Protection Agency in 40 CFR 261.31 through 40 CFR 261.33.

Historic properties: Under the *National Historic Preservation Act*, these are properties of national, state, or local significance in American history, architecture, archaeology, engineering, or culture, and worthy of preservation.

Hydraulic conductivity: A coefficient describing the rate at which water can move through a permeable medium.

Impacts (effects): As assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the adverse effects, usually measured using a qualitative and nominally subjective technique. In this EIS, as well as in the CEQ regulations, the word impact is used synonymously with the word effect.

Indirect impacts: Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Infrastructure: The basic installations and facilities on which the continuance and growth of a community or state (e.g., roads, schools, power plants, transportation, communication systems) are based.

Intensity (of an earthquake): A measure of the effects (due to ground shaking) of an earthquake at a particular location, based on observed damage to structures built by humans, changes in the earth's surface, and reports of how people felt the earthquake. Earthquake intensity is measured in numerical units on the Modified Mercalli scale. [See Modified Mercalli Intensity scale and magnitude (of an earthquake).]

Intertie: A transmission line that links two or more regional electric power systems.

Interested parties: Those groups or individuals that are interested, for whatever reason, in the project and its progress. Interested parties include but are not limited to private individuals, public agencies, organizations, customers, and potential customers.

Invertebrate: Animals characterized by not having a backbone or spinal column, including a wide variety of organisms such as insects, spiders, worms, clams, crayfish, etc.

Irrigation District: An irrigation district performs only an irrigation function. If other electrical functions are performed, such as residential service or other utility responsibilities, the district may be considered a utility. The term irrigation districts may include agricultural types of districts, such as electrical districts, water delivery districts, and water conservation districts.

Isolated occurrence: A grouping of less than ten artifacts or a single undatable feature. These often consists of redeposited material of questionable locational context that are not related to nearby archaeological sites.

Jurisdictional wetlands: Those wetlands that meet the hydrophytic vegetation, hydric soils, and wetland hydrology criteria under normal circumstances (or meet the special circumstances as described in the U.S. Army Corps of Engineers, 1987, wetland delineation manual where one or more of these criteria may be absent and are a subset of "Waters of the United States").

Kilovolt (kV): The electrical unit of power that equals 1,000 volts.

Lacustrine deposits: Deposits found or formed in lakes.

Level of service: In transportation analysis, a qualitative measure describing operational conditions within a traffic stream and how they are perceived by motorists and/or passengers.

Lithic: A stone artifact that has been modified or altered by human hands.

Load: The amount of electric power required at a given point on a system.

Loop: To tie a substation into an existing transmission line in such a manner as to complete the circuit along that line. Running a double-circuit loop line to a substation would allow an incoming line and an outgoing line.

Low-income population: A population that is classified by the U.S. Bureau of the Census as having an aggregated mean income level for a family of four that correlates to $13,359, adjusted through the poverty index using a standard of living percentage change where applicable, and whose composition is at least 25 percent of the total population of a defined area or jurisdiction.

Loam: A rich, permeable soil composed of a mixture of clay, silt, sand, and organic matter.

Magnitude (of an earthquake): A quantity characteristic of the total energy released by an earthquake, as contrasted to "intensity," which describes its effects at a particular place. Magnitude is calculated using common logarithms (base 10) of the largest ground motion. A one-unit increase in magnitude (for example, from magnitude 6 to magnitude 7) represents a 30-fold increase in the amount of energy released. Three common types of magnitude are Richter (or local) (M_L), P body wave (m_b), and surface wave (M_s).

Major source: Any stationary source or group of stationary sources in which all of the pollutant-emitting activities at such source emit, or have the potential to emit, 100 or more tons per year of any regulated air pollutants.

Mammal: Animals in the class Mammalia that are distinguished by having self regulating body temperature, hair, and in females, milk-producing mammary glands to feed their young.

Megawatt (MW): The electrical unit of power that equals 1 million watts or 1 thousand kilowatts.

Merchant plant: A power plant not owned by a utility.

Mesa: An isolated relatively flat-topped natural elevation.

Meteorology: The science dealing with the dynamics of the atmosphere and it phenomena, especially relating to weather.

Mineral: Naturally occurring inorganic element or compound.

Minority Population: A population that is classified by the U.S. Bureau of the Census as African American, Hispanic American, Asian and Pacific American, American Indian, Eskimo, Aleut, and other non-White persons, whose composition is at least 25 percent of the total population of a defined area or jurisdiction.

Mitigation: The alleviation of adverse impacts on environmental resources by avoidance through project redesign or project relocation, by protection, or by adequate scientific study.

Modified Mercalli Intensity Scale: The Modified Mercalli Intensity Scale is a standard of relative measurement of earthquake intensity, developed to fit construction conditions in most of the United States. It is a 12-step scale, with values from I (not felt except by a very few people) to XII (damage total).

National Ambient Air Quality Standards (NAAQS): Standards defining the highest allowable levels of certain pollutants in the ambient air. Because the U.S. Environmental Protection

Agency (EPA) must establish the criteria for setting these standards, the regulated pollutants are called criteria pollutants.

National Emissions Standards for Hazardous Air Pollutants (NESHAPs): Emissions standards set by the Environmental Protection Agency for air pollutants which are not covered by National Ambient Air Quality Standards (NAAQS) and which may, at sufficiently high levels, cause increased fatalities, irreversible health effects, or incapacitating illness.

National Environmental Policy Act: 42 U.S.C. 4341, passed by Congress in 1975. The Act established a national policy designed to encourage consideration of the influences of human activities (e.g., population growth, high-density urbanization, industrial development) on the natural environment. NEPA also established the Council on Environmental Quality (CEQ). NEPA procedures require that environmental information be made available to the public before decision are made. Information contained in NEPA documents must focus on the relevant issues in order to facilitate the decision-making process.

National Historic Preservation Act (NHPA): (16 U.S.C. 470) Provides for an expanded national Register of Historic Places (NRHP) to register districts, sites, buildings, structures, and objects significant to American history, architecture, archaeology, and culture. Section 106 requires that the President's Advisory Council on Historic Preservation be afforded an opportunity to comment on any undertaking that adversely affects properties listed in the NRHP.

National Pollutant Discharge Elimination System (NPDES) Permit: Federal regulation (40 CFR Parts 122 and 125) that requires permits for the discharge of pollutants from any point source into the waters of the U.S. regulated through the *Clean Water Act*, as amended.

National Register of Historic Places: A list maintained by the Secretary of the Interior of districts, sites, buildings, structures, and objects of prehistoric or historic local, state, or National significance. The list is expanded as authorized by Section 2(b) of the *Historic Sites Act of 1935* (16 U.S.C. 462) and Section 101(a)(1)(A) of the *National Historic Preservation Act of 1966*, as amended.

Native American: A tribe, people, or culture that is indigenous to the U.S.

Native vegetation: Plant life that occurs naturally in an area without agricultural or cultivation efforts. It does not include species that have been introduced from other geographical areas and have become naturalized.

Noise: Unwanted or undesirable sound, usually characterized as being so loud as to interfere with, or be inappropriate to, normal activities such as communication, sleep, study or recreation. (See background noise.)

Nonattainment: An area shown by monitored data or modeling to exceed National Ambient Air Quality Standards for a particular air pollutant.

Nonattainment area: An area that the U.S. Environmental Protection Agency (EPA) has designated as not meeting (that is, not being in attainment of) one or more of the National

Ambient Air Quality Standards (NAAQS) for criteria pollutants. An area may be in attainment for some pollutants, but not others.

Obligate species: Plant species that almost always occur in wetlands (i.e., greater than 99 percent of the time).

Open Access Transmission Service Tariff: Supports the intent of FERC's Notice of Proposed Rulemaking for Open Access Transmission. Tariff requires Western to offer its transmission lines for delivery of electricity when capacity is available.

Ozone: The triatomic form of oxygen. In the stratosphere, ozone protects the earth from the sun's ultraviolet rays but in the lower levels of the atmosphere, ozone is considered an air pollutant.

Paleontology: The study of fossils.

Particulate Matter: Any finely divided solid or liquid material, other than uncombined water.

Parker-Davis Project: In 1954, the Parker Dam Power Project and the Davis Dam Project were consolidated to form the Parker-Davis Project. The major works include Davis (originally named "Bullhead") Dam and Powerplant, Parker Dam and Powerplant, a high-voltage transmission system, and substations which sectionalize the long transmission lines.

Peak capacity: The maximum capacity of a system to meet loads.

Peak demand: The highest demand for power during a stated period of time.

Peaking power/peaking generation: Power plant capacity that is typically used to meet rapid increases or the highest levels of demand in a utility's load or demand profile. Peaking generation is usually oil, gas-fired, or hydropower generation.

Perched aquifer: Groundwater separated from the underlying main body of groundwater, or aquifer, by unsaturated rock.

Perched groundwater: A body of groundwater of small lateral dimensions lying above a more extensive aquifer.

Permeability: The ability of rock or soil to transmit a fluid.

pH: A measure of the relative acidity or alkalinity of a solution, expressed on scale from 0 to 14, with the neutral point at 7.0. Acid solutions have pH values lower than 7.0, and basic (i.e., alkaline) solutions have pH values higher than 7.0. Because pH is the negative logarithm of the hydrogen ion (H^+) concentration, each unit increase in pH value expresses a change of state of 10 times the preceding state. Thus, pH 5 is 10 times more acidic than pH 6, and pH 9 is 10 times more alkaline than pH 8.

Physiography: The science of the surface of the earth and the interrelations of air, water, and land.

Pinal County Comprehensive Plan: Plan which contains goals, objectives, and policies for the natural environment.

Plume: Visible or measurable discharges of a contaminant from a given point or area of origin into environmental media.

Potable: Suitable for drinking.

Prehistoric: Of, relating to, or existing in times antedating written history. Prehistoric cultural resources are those that antedate written records of the human cultures that produced them.

Present value: The worth of future returns or costs in terms of their current value. To obtain a present value, an interest rate is used to discount these future returns and costs.

Prevention of Significant Deterioration (of air quality) (PSD): Regulations established to prevent significant deterioration of air quality in areas that already meet National Ambient Air Quality Standards (NAAQS). Among other provisions, cumulative increases in sulfur dioxide, nitrogen dioxide, and PM-10 levels after specified baseline dates must not exceed specified maximum allowable amounts.

Prime farmland: Soil types with a combination of characteristics that make the soils particularly productive for agriculture.

Production Costs: The cost of producing electricity.

Project: Involves the construction and operation of the natural gas-fired, simple cycle peaking facility, upgrade and extension of existing 230-kV transmission lines, construction of new 230-kV transmission lines, and construction of the 14-mile long pipeline.

Property: The 300-acre property controlled by Sundance.

Public Involvement Plan: Methodology used by the agency to encourage public participation.

Quaternary: The second period of the Cenozoic era, following the Tertiary; also, the corresponding system of rocks. It consists of two epochs, the Pleistocene and the Holocene.

Raptor: Birds of prey including various types of hawks, falcons, eagles, vultures, and owls.

Record of decision (ROD): A concise public document that records a federal agency's decision(s) concerning a proposed action for which the agency has prepared an environmental impact statement (EIS). The ROD is prepared in accordance with the requirements of the Council on Environmental Quality NEPA regulations (40 CFR 1505.2). A ROD identifies the alternatives considered in reaching the decision, the environmentally preferable alternative(s), factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why they were not.

Reliability: The ability of the power system to provide customers uninterrupted electric service. Includes generation, transmission, and distribution reliability.

Region of Influence (ROI): The geographical region that would be expected to be affected in some way by proposed action and alternative.

Resident fish: Fish species that reside in fresh water throughout their lives.

Right-of-way: An easement for a certain purpose over the land of another, such as a strip of land used for a transmission line, roadway or pipeline.

Riparian: Of or pertaining to the bank of a river, stream, lake, or other water bodies.

Runoff: The portion of rainfall, melted snow, or irrigation water that flows across the ground surface and may eventually enter streams.

San Carlos Irrigation Project: Irrigation and Power Agency operated by the Bureau of Indian Affairs, Department of the Interior. The Power Division covers approximately 3,000 square miles in Pinal, Pima, Gila, and Maricopa counties of central Arizona.

Saturated zone: The zone in which the voids in the rock or soil are filled with water at a pressure greater than atmospheric pressure. The water table is the top of the saturated zone in an unconfined aquifer.

SCONOx™: The SCONOx ™ Catalytic Absorption System is a proprietary catalyst developed by Goal Line Environmental Technologies LLC. The system design is based on catalytic oxidation and absorption technologies. The catalytic functions of the system are the oxidation of CO to CO2 and NO to NO2 . The system is designed to reduce both CO and NOx emissions from natural gas-fired power plants to levels below ambient concentrations.

Scoping: An early, open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

Section 106 process: A National Historic Preservation Act (16 U.S.C. §470 et seq.) review process used to identify, evaluate, and protect cultural resources eligible for nomination to the National Register of Historic Places that may be affected by federal actions or undertakings.

Sediment: Material deposited by wind or water.

Sedimentation: The process of deposition of sediment, especially by mechanical means from a state of suspension in water.

Seismic: Pertaining to any earth vibration, especially an earthquake.

Sensitive species: Those plants and animals identified by the Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trend in populations or density and significant or predicted downward trend in habitat capability.

Simple-Cycle facility: A facility which contains combustion turbines similar to a jet engine. Large volumes of air are forced to high pressures in a compressor. Natural gas is injected and combustion occurs. The resulting high-temperature, high-pressure exhaust gases are expanded in a turbine which produces electricity.

Site: Land that contains the generating power plant and the infrastructure occupying less than 50 acres of the Property.

Socioeconomics: The social and economic condition in the study area.

Solid waste: In general, solid wastes are non-liquid, non-soluble discarded materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes include sewage sludge, agricultural refuse, demolition wastes, and mining residues.

Spill: Water passed over a spillway or regulating outlets and not going through turbines to produce electricity.

Stability class: A category characterizing the degree of stability, or absence of turbulence, in the atmosphere.

Standard provisions: One of the initial components, it refers to standard contract terms and conditions included in Sierra Nevada Region transactions.

State Historic Preservation Officer (SHPO): The official within each state, authorized by the state at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the *National Historic Preservation Act.*

Step-up transformer: Transformer in which the energy transfer is from a low- to a high-voltage winding or windings. (Winding means one or more turns of wire forming a continuous coil for a transformer, relay, rotating machine, or other electric device.)

Stratigraphic: Of, relating to, or determined by stratigraphy; the superposition of layers (soil, rock, and other materials) often observed at archaeological sites.

Substation: Facility with transformers where voltage on transmission lines change from one level to another.

Surface water: All bodies of water on the surface of the earth and open to the atmosphere, such as rivers, lakes, reservoirs, ponds, seas, and estuaries.

Sundance Energy LLC: The applicant proposing to construct and operate the Sundance Energy Project.

Switchyard: Facility with circuit breakers and automatic switches to turn power on and off on different transmission lines.

Tap: To tie a substation into an existing transmission line through a connection.

Tap Point: The point where two transmission lines interconnect.

Tesla: Unit of measurement of magnetic field.

Threatened species: Plant and wildlife species likely to become endangered in the foreseeable future.

Threatened or Endangered species: Animals, birds, fish, plants, or other living organisms threatened with extinction by man-made or natural changes in their environment. Requirements for declaring species endangered are contained in the *Endangered Species Act of 1973*.

Traditional Cultural Property/Use Area: Areas of significance to the beliefs, customs, and practices of a community of people that have been passed down through generations.

Transformer: A device for transferring energy from one circuit to another in an alternating-current system. Its most frequent use in power systems is for changing voltage levels.

Transmission line: The structures, insulators, conductors and other equipment used to transfer electrical power from one point to another.

Transmission services: These services may include firm and nonfirm transmission, as well as transmission by a third party. Firm and nonfirm transmission services occur when capacity and energy are received into a system at points of interconnection with other systems and transmitted and delivered to points of delivery from a system. The CVP system may include transmission facilities owned by the Sierra Nevada Region or facilities that the Sierra Nevada Region has an entitlement or contractual right to use. Third party transmission means the Sierra Nevada Region uses transmission facilities other than its own to provide delivery of CVP power to its customers.

Transmissivity: A measure of a water-bearing unit's capacity to transmit fluid: the product of the thickness and the average hydraulic conductivity of a unit. Also, the rate at which water is transmitted through a strip of an aquifer of a unit width under a unit hydraulic gradient at a prevailing temperature and pressure.

U.S. Environmental Protection Agency (EPA): The independent federal agency, established in 1970, that regulates federal environmental matters and oversees the implementation of federal environmental laws.

Vertebrate: Animals that are members of the subphylum Vertebrata, including the fishes, amphibians, reptiles, birds, and mammals, all of which are characterized by having a segmented bony or cartilaginous spinal column.

Volatile Organic Compounds: A broad range of organic compounds, often halogenated, that vaporize at typically background or relatively low temperatures.

Volt: The unit of voltage or potential difference. It is the electromotive force which, if steadily applied to a circuit having a resistance of one ohm, will produce a current of one ampere.

Voltage: Potential for an electric charge to do work; source of an electric field.

Water rights: Permits or licenses issued after application to the State Water Resources Control Board are submitted.

Western Area Power Administration: A power marketing agency of the U.S. Department of Energy (DOE) that was established on December 21, 1977, pursuant to Section 302 of the DOE Organization Act, Public Law 95-961.

Western's Desert Southwestern Customer Service Regional Office (DSW): Manages transmission facilities in the States of Arizona, California, and Nevada.

Wetland: Land or areas exhibiting hydric soil concentrations, saturated or inundated soil during some portion of the year, and plant species tolerant of such conditions.

Wind rose: A circular diagram showing, for a specific location, the percentage of the time the wind is from each compass direction. A wind rose for use in assessing consequences of airborne releases also shows the frequency of different wind speeds for each compass direction.

Yield: A measure of the availability of water to meet authorized purposes sometimes defined in terms of the ability to meet project needs within specific time periods.

DOE/EIS - 0322

Sundance Energy Project
Final Environmental Impact Statement

Western Area Power Administration

June 2001

DOE/EIS - 0322

COVER SHEET

Title: Sundance Energy Project, Pinal County, AZ, Final Environmental Impact Statement

Lead Agency: U.S. Department of Energy, Western Area Power Administration

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ABSTRACT

Sundance Energy LLC (Sundance) has applied to the Western Area Power Administration (Western) to interconnect a planned generator facility to Western's transmission system in the vicinity of Coolidge, Arizona. Western's proposed action is to enter into an interconnection and construction agreement with Sundance for the requested interconnection. The proposed interconnection would integrate the power generated by the Sundance Energy Project (Project) into the regional transmission grid and would allow Sundance to supply its power to the competitive electric wholesale market.

The proposed Project would be built on private lands southwest of Coolidge. The proposed Project would be a Apeaking power plant project@ which means it would provide energy when it is needed during peak demand periods in the region. The proposed Project would also be a Amerchant plant@ which means it is not owned by a utility and there is currently no long-term commitment or obligation by any utility to purchase the energy generated by the power plant.

Western, as a major transmission system owner, must generally provide access to its transmission system when requested by an eligible organization per existing policies, regulations and laws. The proposed Project would consist of the construction and operation of a generating facility; construction of a 14-mile pipeline to supply natural gas to the proposed Facility; a new 230-kV bay at an existing substation; a new double-circuit 230-kV transmission line; a new single-circuit 230-kV transmission line; an upgrade of a 115-kV line to 230-kV specifications; and an upgrade of an existing substation. Three alternatives would consist of different locations of the 230-kV transmission lines and would not involve upgrading the 115-kV line or the existing substation. The environmentally preferred alternative is Alternative 3, the power line routing that is furthest west.

CHANGES SINCE THE ISSUANCE OF THE SUNDANCE ENERGY PROJECT DRAFT EIS

The Sundance Energy Project Draft Environmental Impacts Statement (DEIS) was issued on March 23, 2001. A public hearing was held in Coolidge, Arizona on April 12, 2001. The comment period ended on May 7, 2001. Comments from 15 individual commentors were received on issues associated with the proposed Sundance Energy Project (Project). These comments were considered and where appropriate changes to the Draft EIS were made. The comments and responses to the comments were collated into a Comment Response Document. The Comment Response Document is included in this Final EIS as Appendix C.

The changes to the analyses and discussion presented in the DEIS were minor and confined to the reassessment of air quality, and additional information concerning water and cultural resources (see below). In these circumstances the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) (40 CFR Parts 1500.4 and 1503.4) call for "attaching and circulating only changes to the draft environmental impact statement, rather than rewriting and circulating the entire statement." Therefore, this Final EIS is not a reprint of the Draft EIS. This Final EIS includes the amended sections of the Draft EIS and the Comment Response Document, Appendix C. In addition, the amended analyses and new information was carried forward into the Summary and cumulative impact sections that are also included in this Final EIS.

Shortly after the issuance of the DEIS, the Pinal County Air Quality Control District completed its review of the Sundance Air Permit Application. The Pinal County Air Quality District Control Director determined that the Selective Catalytic Reduction (SCR) method of controlling air emissions, specifically NO_x emissions, would be required of the proposed Facility. As a result, the predicted NO_x emissions would be decreased by 80% from those originally predicted. The air quality impacts from the proposed Project have been revised to include the new SCR air control method (see Section 4.2, Air Quality).

In the DEIS and the original Air Permit Application to Pinal County Air Quality Control District, Sundance proposed two optional operations configurations. The proposed Facility would either install and operate 12 General Electric LM6000 combustion turbines, or six LM6000 combustion turbines and two General Electric 7FA combustion turbines. Through the air permitting process, Sundance has decided to operate the proposed Facility with the 12 LM6000 combustion turbines. The new air analysis in the amended Section 4.2 only discusses the potential impacts from this configuration.

The DEIS identified three alternative transmission line routes for the interconnection to the Western's transmission lines. The environmentally preferred alternative is Alternative 3, the route furthest to the west.

SUMMARY

Sundance Energy LLC (Sundance) has applied to the Western Area Power Administration (Western) to interconnect a planned generator facility to Western's transmission system in the vicinity of Coolidge, Arizona in Pinal County, southwest of Phoenix. Western's proposed action is to enter into an interconnection and construction agreement with Sundance for the requested interconnection. The proposed interconnection would integrate the power generated by the project into the regional transmission grid and would allow Sundance to supply its power to the competitive electric wholesale market. Western's formal process for determining the availability of transmission capacity for the proposed interconnection is in its preliminary stages. The evaluation of environmental impacts in this EIS is one of these preliminary steps. At this point, it is foreseen that there is enough potential capacity to continue the formal determination process.

Sundance proposes to construct and operate the Sundance Energy Project (Project), a natural gas-fired, simple cycle power plant on private lands southwest of Coolidge. The proposed Project would consist of a nominal 600 megawatt (MW) natural gas fired, simple cycle peaking generating facility and associated infrastructure, newly constructed and upgraded transmission lines, a pipeline to supply additional natural gas, a water supply well, and access roads. Under the No Action Alternative, Western would reject the Sundance application to interconnect to Western's transmission system, and the proposed facility, transmission lines, and pipeline would not be built. Sundance may appeal Western's decision to the Federal Energy Regulatory Commission

This Environmental Impact Statement (EIS) was prepared in accordance with Section 102(2) of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4332, Council of Environmental Quality regulations, and U.S. Department of Energy (DOE) NEPA Implementing Procedures (10 CFR 1021). Western is the lead Federal agency, as defined by 40 CFR 1501.5.

Western will use the information provided in this EIS to support Federal decisions for the proposed Project. Western will decide whether to enter into an interconnection and construction agreement with Sundance and, if approved, the best way to interconnect the proposed Project into the Western transmission system to provide the needed transmission services.

UNDERLYING PURPOSE AND NEED FOR AGENCY ACTION

Sundance is responding to the need to provide additional supply of electricity to the Phoenix metropolitan area and surrounding region during peak demand periods. Reserve margins (generation supply - peak load) have decreased considerably in the region over the past decade. Sundance has a need to make a profit selling its power in the regional wholesale market. Based on these needs, Sundance purposes include siting the proposed Project near existing gas and water supplies, and transportation facilities near the Coolidge Substation, thus interconnecting with the Phoenix 230-kV loop, and away from densely populated residential areas. Sundance purposes also include benefiting Pinal County by increasing the reliability of the local electrical system and using land available at marketable rates.

PURPOSE AND NEED FOR AGENCY ACTION

Western, as a major transmission system owner, must generally provide access to its transmission system when it is requested by an eligible organization per existing policies, regulations and laws. Sundance applied to interconnect its proposed power plant with Western=s transmission line system in the vicinity of Coolidge.

The purposes of the Proposed Action include:

- To meet the requirements of Western=s Open Access Transmission Service Tariff, which is intended to meet the intent Federal Energy Regulatory Commission of (FERC) Order No. 888 in providing non-discriminatory transmission access.

- To provide transmission service and capacity for the proposed Project without degrading service to existing customers.

- To ensure transmission system reliability is maintained.

- To cause the minimum practical adverse environmental effects, consistent with sound land management practices.

Although the Federal action is to decide whether to allow Sundance to interconnect to Western's transmission system, the construction and operation of the proposed Project is a directly connected action. Therefore, this document evaluates the proposed Project as well as the interconnection.

SCOPING

The Notice of Intent to prepare an EIS for the proposed Project was published in the *Federal Register* on September 1, 2000. Comments received on issues to be evaluated in the Sundance Energy Project EIS included: the need for the proposed Project; proposed Project alternatives; public role in decision making; effects on the rural character of the area; routing and height of new transmission lines; and effects on the biological, cultural, water, and visual resources, as well as on air quality and noise. These issues are included in the analyses and discussions presented in this EIS. In addition, consultations have been initiated with Federal, state, and local resource management and regulatory agencies as well as interested tribal governments.

PUBLIC COMMENT PROCESS

The Notice of Availability for the Draft Sundance Energy Project EIS was published in the Federal Register on March 23, 2001. A public hearing was held in Coolidge, AZ on the evening of April 12, 2001, where verbal and written comments were collected. Other comments were submitted by mail. The comment period ran through May 7, 2001. A total of 15 commentors made comments on the DEIS and related issues.

These comments were considered and where appropriate, changes to the Draft EIS were made. The comments and responses to the comments were collated into a Comment Response Document, Appendix C. The Comment Response Document, Appendix C, is included in this Final EIS. Table C-1 shows a breakdown of the comments by issue category.

PROPOSED ACTION AND ALTERNATIVES

The proposed Project would consist of the construction and operation of a generating facility (Facility); construction of a 14-mile pipeline to supply natural gas to the proposed Facility; a new 230-kV bay at an existing substation; a new double-circuit 230-kV transmission line; a new single-circuit 230-kV transmission line; an upgrade of a 115-kV line to 230-kV specifications; and an upgrade of an existing substation. Three alternatives would consist of different locations for the 230-kV transmission lines.

NO ACTION ALTERNATIVE

Under the No Action Alternative, Western would not allow Sundance to interconnect with Western's transmission system. Without the ability to interconnect to Western's transmission lines, the proposed Project would not be feasible and would not be built. Sundance may appeal Western's decision to the Federal Energy Regulatory Commission. Upon hearing the appeal FERC may or may not reverse Western's decision.

IMPACTS

Resource areas evaluated for potential impacts include land use, air quality, noise, infrastructure, water resources, geology and soils, biological resources, cultural resources, visual resources, transportation, socioeconomics, and environmental justice. Table S-1 summarizes the environmental consequences of the Proposed Action and alternatives. The most significant resource area impact of the Proposed Action would be visual resources. The proposed Facility's 60- and/or 100-foot tall stacks and 120 foot transmission pole structures would have a strong linear, vertical form that would contrast with the surrounding flat, horizontal landscape. The visual quality impacts of the vertical structures would be minor because the structures would be seen by a relatively small number of residents and travelers. No significant or long-term impacts are expected in other resource areas. Short-term effects would be primarily related to construction activities and would, for the most part, return to normal after construction has been completed.

The Proposed Action would have positive effects on some resource areas including the following:

- The local economy would experience a small boost over the life of the project due to payroll earnings and construction expenditures.

- The assessed value of the Property would increase and result in a substantial increase in property revenues to the local taxing district.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
LAND USE	**Facilities** No long-term impacts to land uses. Minimal impacts related to siting, construction, and operation of the proposed Facility. Short-term impacts would include increased daytime noise and dust during construction. An access road would be constructed on the Property. No disruption to land uses from access road construction. Overall recreation activities would not be significantly affected. Paving a segment of Randolph Road would negatively impact horseback riding along the road, but other unimproved roads in the area could offer enjoyment of equestrian activities. **Pipelines** No permanent disturbance to croplands. Construction on agricultural land would cause temporary loss of crops on the construction right-of-way (ROW) (about 124 acres). A year=s loss of crops could occur along the ROW. Crop yields may be reduced for one to two years following construction. Temporary construction disturbance of about 36 acres of vacant land, 9 acres of industrial land, and 1.2 acres of urban/residential land. Short-term effects would include noise, dust, and traffic detours during construction. Access would be from existing local, county, and state roads. Proposed natural gas line would be compatible with future land use planning. **Transmission Lines** No impacts to existing land status and land uses. Permanent ROW would be affected by the removal of about five acres of vegetation during the installation of tower structures related to ED2 Line upgrades and 0.5 acres between the proposed Facility and Signal Substation. No long-term impacts are expected to other land uses within or adjacent to the new line from the proposed Facility to the Liberty-Coolidge Line. The location of the transmission lines would not change,	No impacts to existing land uses in the area.	**Alternative 1** The amount of land disturbed would be 11.2 acres along the ROW. All other impacts would be similar to impacts for the Proposed Action. **Alternative 2** The same as Alternative 1. **Alternative 3** About 6.8 acres of cropland and 7.2 acres of native vegetation on State Trust land would be disturbed during the installation of structures related to this alternative.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
LAND USE (continued)	therefore, there would be minimal impacts to crop dusting in the area. Short-term effects to residential areas related to construction and operation would include noise, dust, and traffic detours,; obstruction of traffic at road crossings; and maintenance activities including the physical intrusion of crew and equipment on private lands. No impacts to recreational uses.		
AIR QUALITY	**Facilities** Minimal air impacts due to construction and operation of the proposed Facility. Configuration 1 would result in the maximum impact. Maximum annual NO_x and 24-hour PM_{10} concentrations are predicted to occur on the high terrain to the west and northwest of the proposed Facility on the eastern ridges of the Sacaton Mountains. The proposed Facility would be a major PSD source for NO_x and CO. For Configuration 1, the PSD Class II increment consumption in significance area of proposed Facility would be 6 percent of NO_2 PSD Class II increment of 25 Fg/m^3. For Configuration 2, the PSD Class II increment consumption in significance area of proposed Facility would be 11.56 percent of NO_2 PSD Class II increment. Visibility is predicted to decrease five percent one day in the Class I airshed, Superstition Wilderness, in December and March. Acid deposition impacts are predicted at two Class I airsheds, Superstition Wilderness and Saguaro West National Park. **Pipelines** Fugitive dust emission impacts are expected from construction activities along the ROW. Impacts are comparable to current agricultural activities in the area. **Transmission Lines** Fugitive dust emission impacts are expected from construction activities.	No impacts to air quality in the area.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
AIR QUALITY (continued)	Impacts are comparable to current agricultural activities in the area.		
NOISE	**Facilities** The proposed Facility noise levels for the proposed configurations are not expected to exceed 55 dBA. Residences nearest to the 55 dBA noise level could experience increase noise of about 10 dBA above assumed rural background noise level. No blasting is expected during construction. **Pipelines** Noise levels above background (40-45 dBA) during construction. Construction noise would be at one-mile intervals of pipeline construction along the ROW. **Transmission Lines** Noise levels elevated above background during construction. Long-term corona audible noise from transmission lines but this noise is usually lost in background noise beyond the transmission ROW.	No impacts to noise emissions in the area.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.
INFRASTRUCTURE/ WASTE MANAGEMENT	**Facilities** *Electric and Magnetic Field (EMF) Effects* EMF effects are associated with transmission lines. Effects negligible associated with changes to Coolidge and Signal substations. *Infrastructure* No substantial impacts to local area power supplies or natural gas supply. *Waste Management* Potential contamination hazard from the storage and use of fuel, lubricants, and other fluids during construction of plant and access road. No significant effects to municipal solid waste facilities related to the generation of solid waste. **Pipelines** *EMF Effects* Potential for induced currents in pipelines from Western's high voltage lines.	No impacts to infrastructure and waste management.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
INFRASTRUCTURE/ WASTE MANAGEMENT (continued)	*Infrastructure* Natural gas pipeline to only service the proposed Facility. Gas company could potentially decide to extend the pipeline to the northwest, which could increase availability of natural gas in the region. *Waste Management* Potential contamination hazard from the storage and use of fuel, lubricants, and other fluids during construction. Impacts would be minimized by the restriction of refueling activities from dry washes and by requiring immediate cleanup of spills and leaks. **Transmission Lines** *EMF Effects* No significant potential for corona effects and field effects. Magnetic field would be similar to that of common household appliances. Health effects would be similar to those for existing lines. *Infrastructure* No substantial impacts to local power supplies are anticipated. Power requirements expected to be equivalent to an agricultural warehouse or processing plant. *Waste Management* Potential contamination hazard from the storage and use of fuel, lubricants, and other fluids during construction. Impacts would be minimized by the restriction of refueling activities from dry washes and by requiring immediate cleanup of spills and leaks.		

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
WATER RESOURCES	**Facilities** *Surface Water Quantity* No impacts expected from the use of CAP water to other users. The proposed Facility usage expected to help defray operation and maintenance costs of CAP system. *Surface Water Quality* No impacts expected from the extraction of CAP water. Potential contamination from storage and use of fuels, lubricants, fluids, and chemicals during construction and operation. Minimal impacts to drainage patterns are anticipated. *Groundwater Quantity* Minimal impacts to other users are anticipated from groundwater usage. Groundwater pumping is expected to have minimal impact on the Pinal AMA aquifer. No subsidence is anticipated from groundwater pumping. *Groundwater Quality* No impact is expected from construction and operation of the proposed Facility. Potential impacts from potential spills or leaks of fuel, lubricants, fluids, and chemicals during proposed Facility operation. Effluent water quality would be similar to quality of backup water wells. No impacts from use of effluent water for agriculture. No impacts anticipated from blending water prior to agricultural use. **Pipeline** *Surface Water Quantity* Increased runoff is anticipated related to storms and large flow events in disturbed areas. *Surface Water Quality* Potential impacts associated with construction and hydrostatic testing. Potential for increased erosion, sedimentation, turbidity, release of chemical and nutrient pollutants; and	No impacts to surface water or groundwater in the area.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
WATER RESOURCES (continued)	introduction of chemical contamination from fuels and lubricants. No impacts are expected from the use of effluent water for agriculture. *Groundwater Quantity* No impacts are anticipated to groundwater quantity. *Groundwater Quality* Potential impacts from potential spills or leaks of fuel, lubricants, and fluids construction activities. **Transmission Lines** *Surface Water Quantity* No impacts to surface water resources are anticipated related to construction along transmission lines in the area. *Surface Water Quality* Potential impacts from increased sedimentation and turbidity during construction. Potential impacts from accidental spills of fuel, lubricants, and fluids during construction. *Groundwater Quality & Quantity* No groundwater resources would be impacted.		
GEOLOGY AND SOILS	**Facilities** *Geology* Minimal impacts from slope failure and soil erosion. No impacts to sand and gravel availability. Seismic risk is low to moderate. Quick alluvial deposits should be relatively stable. *Soils* Soil erosion impacts are expected to be minor due to minimal rainfall and slopes of less than one percent. **Pipelines** *Geology* Minimal impacts from slope failure. Seismic risk is low to moderate; quick alluvial deposits should be relatively stable.	No impacts to geology and soils in area.	**Alternative 1** The same as the Proposed Action, except about 11.2 acres would be disturbed. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action, except that an additional 14 acres would be disturbed.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
GEOLOGY AND SOILS (continued)	Potential for flash flooding in narrow washes along ROW. *Soils* About 124 acres of prime farmland soils would be disturbed which would alter soil structure and impact productivity. **Transmission Lines** *Geology* Minimal impact on future sand and gravel extraction within the ROW. Minimal risk of rockfalls and landslides. Seismic risk is low to moderate; quick alluvial deposits should be relatively stable. *Soils* About 6.6 acres of prime farmland soils would be disturbed which would alter soil structure and temporarily impact productivity. Minimal impacts from slope failure and soil erosion.		
BIOLOGICAL RESOURCES	**Facilities** *Vegetation and Wildlife* Potential impacts to vegetation and wildlife. Potential loss and/or disturbance of 50 acres of sparsely vegetated native habitats during construction. Potential loss of food, cover, habitats, and/or breeding sites for some species. *Special Status Species* No adverse impacts are anticipated to special status species in Pinal County. **Pipelines** *Vegetation and Wildlife* Potential impacts to vegetation due to the loss and/or disturbance to native plant communities; disturbance of about 124 acres of croplands and loss of 36 acres of sparse native vegetation. *Special Status Species* Potential adverse effects for species known to occur in Pinal County. About 110 acres of mountain plover habitat would be temporarily disturbed. Minimal impact expected due to loss of habitat.	No impacts to biological resources in the area.	**Alternative 1** *Vegetation and Wildlife* Croplands would be eliminated in areas where tower structures would be installed. Croplands would be eliminated in small areas during installation of new structures to reroute the Coolidge-ED2 Line. ***S**pecial Status Species* No impacts would occur. **Alternative 2** Impacts are the same as those in Alternative 1. **Alternative 3** Temporary loss of 7.2 acres of native vegetation. Minimal impacts to wildlife habitat. No impacts to special status species.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
BIOLOGICAL RESOURCES (continued)	**Transmission Lines** *Vegetation and Wildlife* No impacts due to the construction of the four-mile transmission line. *Special Status Species* No impacts would occur.		
CULTURAL RESOURCES	**Facilities** No significant historic properties were found in the proposed Site during previous cultural surveys. Prehistoric artifact scatter was recorded outside the area of potential effect. **Pipelines** Past investigations indicate a low potential for significant historic or prehistoric sites. Previous inventories would be reviewed before construction. Potential disturbances not covered by previous investigations would be inventoried before construction. **Transmission Lines** Inventories have not been completed in the proposed affected area. Inventories would be completed before construction begins. Past inventories in general area indicate a high likelihood for sites along north end of the Signal-Coolidge upgrade. The Signal Switchyard appears less likely to contain significant historic properties.	No impacts to cultural resources in the area.	**Alternative 1** Similar potential to the Proposed Action with the exception of rerouting. Disturbances caused by rerouting the Coolidge-Signal Line from section 19 to the Coolidge Substation and replacement of structures located near areas with a high potential for the presence of potential significant historic and prehistoric resources. These potentially affected areas would be inventoried before construction begins. **Alternative 2** The impacts are the same as Alternative 1. **Alternative 3** The impacts are the same as Alternative 1.
VISUAL RESOURCES	**Facilities** Impacts to visual landscape from the addition of buildings, exhaust stacks, and night lighting when viewed from sensitive viewpoints, travel routes, recreation areas, and residences. **Pipelines** Short-term impacts due to construction and operation of gas pipeline. Short-term impacts due to vegetation removal in the ROW until vegetation has been reestablished in disturbed areas. No impacts to croplands after the ROW has been replanted with crops. **Transmission Lines** Short-term impacts during construction while using local roads. Significant long-term impacts to the landscape from the	No impacts to viewshed in the area.	**Alternative 1** The new one-half mile line constructed between Coolidge-ED2 and Coolidge-Signal lines, and the associated structures would be more visible in the foreground by visitors to Casa Grande National Monument. The structures would not be visible to Casa Grande National Monument at a distance of 2.5 miles. **Alternative 2** The impacts are the same as Alternative 1.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
VISUAL RESOURCES (continued)	installation of pole structures when viewed from sensitive viewpoints and in scenic landscapes. New transmission pole structures from the construction of the new 4.2 and 1.5 mile lines between the proposed Facility and the Signal Substation would be visible to a small number of residents and travelers on nearby county roads. Structures would be visible to a small number of residents and travelers. The nearest locations that a significant number of people would be able to view the structures associated with the construction of the line between Signal Substation and the interconnect with the Liberty-Coolidge Line would be 1.5 miles away in Coolidge and Casa Grande National Monument. No impacts from the upgrade of the line between the interconnection and Coolidge Substation. Transmission line structures would not be visible to visitors at Casa Grande National Monument at a distance of 2.5 miles.		**Alternative 3** The impacts are the same as Alternative 1.
TRANSPORTATION	**Facilities** Access road would be entirely within the Property. Short-term traffic impacts from construction activities and construction traffic are expected at the junction of Randolph Road and the access road. Short-term traffic delays may occur in Coolidge due to the large vehicles delivering equipment. **Pipelines** Short-term construction related traffic impacts at highway crossings. **Transmission Lines** Access to ROW would be from Tweedy Road. Access to existing ROW expected to cause temporary traffic impacts from construction-related traffic stops and lane closures. Access to new ROW would be from existing county roads.	No impacts to traffic and roadways in the area.	**Alternative 1** Traffic related impacts are similar to the Proposed Action minus traffic related to the construction of lines between the proposed Facility and Signal Substation and the Coolidge-ED2 upgrade. **Alternatives 2** Traffic impacts would be the same as Alternative 1. **Alternative 3** Traffic impacts would be similar to Alternative 1 with one exception. Since the new 230-kV lines would not be constructed along Tweedy Road, temporary traffic disruptions along Tweedy Road would not occur.

Table S-1
Environmental Consequences

Affected Environment	Proposed Action	No Action	Alternative
SOCIOECONOMICS	**Facilities** Local labor market and economy may be affected. Direct employment of labor related to facility construction and operation. Indirect labor effects related to services provided by support industries. Local economy would be affected by direct project spending and induced economic effects. Minimal effects to public utilities, services, and schools in Coolidge and Phoenix. **Pipelines** Pipeline construction expected to have minimal impact on the economy. Payroll and construction expenditures and property taxes are expected to benefit Pinal County. **Transmission Lines** Construction and operation is expected to have minimal impacts to local economy. Minimal impacts on local emergency services expected. Local area and regional systems are expected to benefit from the increased supply and reliability of power.	No impacts to the local labor market, economy or housing.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.
ENVIRONMENTAL JUSTICE	**Facilities** No impacts to environmental justice from construction and operation of the facility. **Pipelines** No impacts to environmental justice from construction and operation of pipelines. **Transmission Lines** No impacts to environmental justice from construction and operation of transmission lines.	No impacts to environmental justice.	**Alternative 1** The same as the Proposed Action. **Alternative 2** The same as the Proposed Action. **Alternative 3** The same as the Proposed Action.

3.8 CULTURAL RESOURCES

The current Coolidge Substation, which augmented and replaced the original Coolidge Substation, was initially completed in 1950 as an element of the Davis Dam Project. The new substation was expanded multiple times after 1950, and it became one of the most important power facilities in Arizona in terms of interconnection of the transmission system. However, major alterations were made to the substation beginning in 1964, including the replacement of most of the original equipment. Coolidge Substation is therefore unlikely to retain sufficient integrity of original construction to qualify for eligibility for the National Register of Historic Places (NRHP).

The Coolidge-ED2 transmission line was built in 1950 as an element of the Davis Dam Project. The Coolidge-Signal Line, which runs parallel to the Coolidge-ED2 Line in the proposed Project vicinity, was constructed in 1964 as an element of the Parker Davis Project. Both lines are standard wood pole H-frame transmission lines and deliver power to the ED2 Substation primarily for water pumping and residential purposes. Neither line appears to have particular historical or technological significance that might qualify the line for eligibility for the NRHP.

Signal Substation was completed by the Bureau of Reclamation in 1965 as an element of the Parker Davis Project. The substation was constructed with standard commercial components including 115-kV and 12.47-kV transformers and switching structures. The Liberty-Coolidge 230-kV transmission line was completed by Western in 1987. Signal Substation and the Liberty-Coolidge Line do not appear to have the exceptional significance require for NRHP eligibility of properties that are less than 50 years old.

3.8.1 Facilities

The proposed Facility is on an alluvial plain south of the Gila River at an average elevation of about 1,420 feet above MSL, located at the northwest portion of the Property. The proposed Facility and much of the western end of the Property are previously cultivated land that has been partially reclaimed by native vegetation. Near the center of the western half of the Property is an excavation that appears to have been a borrow pit, and subsequently has been used as a dump for structural debris. The remainder of the Property (roughly three-quarters) is currently in use as cotton and alfalfa fields. Historically, this has been a sparsely settled agricultural area dominated by cotton cultivation, and prehistoric use of the area was likely to have been sparse as well.

A records search at the Arizona State Museum indicated that two archaeological surveys have been conducted within a one-mile radius of the Property (Greystone 2000e). Archaeological survey of the proposed Site recorded only one prehistoric site that is recommended as not eligible for inclusion in the National Register of Historic Places (NRHP) (Slawson 1999). The Class I archaeological survey indicated there are other sites within a mile of the proposed Project (Greystone 2000e, Northland 2001, Slawson 1999). Low-density artifact scatters and isolated occurrences with no associated features were reported. None of the historic or prehistoric materials that may be considered eligible for inclusion in the NRHP are within or close to the proposed Facility (Greystone 2000e).

The proposed Project is within the traditional territories of several tribal groups, and there are Native American communities in the vicinity that maintain aspects of their traditional cultures. In September 2000, the applicant contacted the Gila River Indian Community and the Ak-Chin Indian Community to inform them about the proposed Project. The contact letter also indicated that Western would contact the communities and that Sundance would be interested in tribal participation in archaeological surveys. Sundance has not received any response from the communities. Western has contacted the tribal governments of seven Native American communities that are likely to have traditional concerns in the area to notify them of the proposed Project and solicit any concerns they may have about potential impacts. The Ak-Chin Indian Community, the Gila River Indian Community, the Hopi Tribe, the Pascua Yaqui Tribe, the Salt River Pima-Maricopa Indian Community, the San Carlos Apache Tribe, and the Tohono O'odham Nation have each been consulted by Western on this project.

The Gila River Indian Community, the Tohono O'odham Nation, the Hopi, and the San Carlos Apache have indicated to Western that they have concerns about the proposed Project. Both the Ak Chin and Salt River Pima-Maricopa Indian Communities defer to the Gila River Indian Community in this consultation; the Pascua Yaqui have not yet responded. A representative of the Hopi commented that the entire area around the Gila River is a "middle place" in Hopi legends and is an area of concern to the Hopi people. Archaeological sites are often viewed as proof of oral traditions by the Hopi, and they traditionally interpret archaeological sites as evidence of the Hopis' *Covenant of Natwani*. Because of the importance of archaeological remains to Hopi culture and religion, the Hopi wish to be informed about any disturbances to archaeological materials on the proposed Project. Traditional cultural information is confidential and sensitive, and many tribal representatives are reluctant to divulge information about traditional localities. A lack of response to tribal notification should not be interpreted as a lack of concern or an indication that there are no sensitive localities within the proposed Project area.

An issue of concern to all groups is the possibility of disturbing previously undiscovered human remains. Procedures for consultation with tribal groups regarding unavoidable or unanticipated disturbance of human remains and funerary objects are specified in amendments to the Arizona Antiquities Act (A.R.S. part 41-844). Another issue of potential concern is disturbance of localities or natural features named in traditional stories. Some of these localities also serve as shrine or ritual sites and are currently still in use.

The Casa Grande Ruins are a Traditional Cultural Property to the Hopi, the Gila River Indian Community, the Tohono O'odham Nation and the Ak-Chin Indian Community. The proposed Facility would have no direct impact on these ruins and would not visually intrude on the Property (see Visual Resources, Section 4.9.1.1). The Gila River Indian Community considers other less well known archaeological sites and petroglyph sites in the region as Traditional Cultural Properties, especially those in the Santan and Sacaton Hills. Concern regarding impacts to visibility and use of these areas were expressed and Sundance has addressed these through changes in the proposed Project emissions (see Air Quality, Section 4.2). The proposed Facility will have no direct impact on these Properties.

3.8.2 Pipelines

The proposed pipeline runs from the proposed Facility southwestward about 14 miles and parallel to the El Paso Line 2025 and the El Paso Line 1600 to an interconnect with El Paso Lines 1100 and 1103. The proposed pipeline would pass between the modern towns of Eloy and Casa Grande about two miles southeast of Casa Grande near the north end of the Casa Grande Mountains. Most of the land crossed by this pipeline corridor is under cultivation or has been cultivated at some time in the past. The final three miles from Interstate 8 to the interconnection are largely reclaimed by native vegetation.

The site and inventory cards at the Arizona State Museum were checked and records indicate that eight previous investigations have been conducted within one mile of the proposed pipeline route, and four cultural resource sites have been recorded. Based on the results of the investigations, few significant cultural sites are likely to be found in the proposed Project area (Greystone 2000e). However, 27 irrigation ditches occur within the Project area and their historical significance has yet to be determined. The All American Pipeline was previously surveyed and mitigated for archaeological resources (Ackerly et al. 1989), and has been subject to further archaeological investigation when it was transferred to El Paso Energy Corporation and renamed the Line 2000 (Northland 2000).

3.8.3 Transmission Lines

3.8.3.1 Proposed Action

The proposed new transmission line is along a county road and field margins in the alluvial plain south of the Gila River.

Record searches at the Arizona State Museum for this area indicate that six previous investigations have taken place in the proposed Project vicinity, and that 16 sites have been recorded outside the Casa Grande National Monument. The boundaries of the National Monument encompass the recorded areas for at least 30 separate site numbers. In Class III archaeological surveys of the proposed Signal-Coolidge transmission line and the three proposed alternatives, six previously recorded archaeological sites were identified in areas of potential impact as well as nine newly-identified archaeological sites (Northland 2001). Of these fifteen potentially impacted sites, three sites (AZ AA:2:200, AA:2:30, and U:14:108) are prehistoric habitation or limited activity sites recommended to be eligible for inclusion in the NRHP. Three are prehistoric limited activity sites recommended as potentially eligible for inclusion in the NRHP, and two are historic concrete-lined canal sites believed to be potentially eligible. The remaining seven sites are all historic or modern and are believed to be ineligible for inclusion in the NRHP. Four are historic or modern trash heaps, one is a historic or modern habitation, and two are historic roads that have been improved in the modern era such that they have little historic integrity preserved (Northland 2001). In addition, the proposed transmission line route crosses two large prehistoric (Hohokam) canal systems, the Pinkley Canal and the Casa Grande Canal (Midvale 1963, Northland 2001). Linear dark soil stains were observed during

archaeological survey, and it is recommended that these areas, as well as the areas of previously documented prehistoric canals, be avoided during transmission line construction (Northland 2001).

The Proposed Action would potentially affect sites AZ AA:2:30 and U:14:108 which are both recommended as eligible for inclusion in the NRHP. In addition, the Proposed Action may impact potentially eligible sites: AZ AA:2:203 and AA:2:204 (both prehistoric limited activity sites) and AA:2:130 (Pima Lateral Canal, a historic concrete-lined canal). The Proposed Action may also affect the ineligible historic sites AA:2:127 (Betchel Road) and AA:6:63 (State Route 87).

3.8.3.2 Alternatives 1, 2 and 3

The affected environment of Alternatives 1, 2 and 3 is much the same as that described for the Proposed Action, but somewhat different archaeological sites will be impacted by the various alternatives.

Alternative 1 and Alternative 2 will both potentially affect sites AZ AA:2:30 and U:14:108 which are recommended as eligibile for inclusion in the NRHP. In addition, Alternatives 1 and 2 will potentially impact AA:2:130 which is the potentially NRHP-eligible Pima Lateral historic concrete-lined canal. Alternative 1 and 2 may also affect the ineligible historic sites AA:2:127 (Betchel Road) and AA:6:63 (State Route 87).

Alternative 3 will potentially affect more archaeological sites than the other Alternatives or the Proposed Route. The Alternative 3 Route will potentially affect sites AZ AA:2:200, AA:2:30 and U:14:108 which are all prehistoric sites recommended as eligible for inclusion in the NRHP. In addition, Alternative 3 may impact these potentially eligible sites: AZ AA:2:201, AA:2:129 and AA:2:130 (one prehistoric limited activity site, and two concrete-lined historic canals, the Pima Lateral and the Southside Canal). Alternative 3 may also affect the ineligible historic sites AZ AA:2:207, AA:2:208, AA:2:209, AA:2:210, AA:2:127 (Betchel Road), AA:6:63 (State Route 87) and Field Site 3 (Northland 2001).

4.2 AIR QUALITY

The air quality resource impact analysis consists of evaluating the impacts of criteria and hazardous air pollutant concentrations resulting from construction and operation of the Proposed Action. This is accomplished by using the EPA-recommended ISCST and CALMET/CALPUFF dispersion models to estimate pollutant concentrations and visibility impacts at receptors located within the area of potential effect.

The area of potential effect resulting from construction and operation of the Proposed Action for criteria and hazardous air pollutant concentrations is about 10 kilometers. The area of potential effect for visibility and/or acid deposition impacts includes the designated Class I airsheds at the Superstition Wilderness located about 57 kilometers north-northeast of the site and at the West Saguaro Park located about 75 kilometers south-southeast.

The air quality section discusses the impacts of the construction and operation of the Proposed Action and alternatives on air quality in the area of potential effects. Comparing modeled air pollutant concentrations with Federal and/or Arizona State air quality standards adopted to protect human health and public welfare quantitatively assesses potential air quality effects.

The determination as to whether an impact is significant with respect to criteria and hazardous air pollutant concentrations is determined by adding the maximum modeled air pollutant concentration to the background air pollutant concentration for the respective pollutant. The resulting total is then compared to the Federal and/or Arizona State air quality standard. Pollutant concentrations above the standards are considered significant. Significant impact concentrations for Prevention of Significant Deterioration (PSD) are quantitatively assessed by comparing the Class II increment with modeled pollutant concentrations in the significance area. Consumption of the increment is considered a significant impact. Impacts of air quality related values (AQRV) are evaluated for Class I airsheds located within 100 kilometers of the Proposed Action. A five percent change in extinction (e.g. reduction of visibility) is considered a significant impact.

4.2.1 Facilities

In the DEIS and the original Air Permit Application to Pinal County Air Quality Control District, Sundance Energy reserved the flexibility to either install or operate 12 General Electric LM6000 combustion turbines, or six LM6000 combustion turbines and two General Electric 7FA combustion turbines. A decision has been made to operate the Facility with the 12 LM6000 combustion turbines. The updated site plan diagram is shown in Figure 2-1.

The combustion fuel would be natural gas resulting in emissions of the following criteria pollutants: particulate matter less than 10 microns in diameter (PM_{10}), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), and Volatile Organic Compounds (VOC); and several hazardous air pollutants. Emissions of nitrous oxides (NO_x) result from the combustion process. The regulated pollutant, NO_2, is a portion of the total NO_x emitted. The emissions prepared for the proposed Facility calculate the portion of NO_x emissions that are NO_2. Therefore, references to NO_x actually indicate NO_2.

The ultimate result of the BACT determination by the Pinal County Air Quality District Control Director was that NO_x BACT for the General Electric LM6000 SPRINT combustion turbine is 5.0 parts per million dry volume at 15 percent oxygen (5.0 ppmvd @ 15% O_2). As a result, the NO_x predicted emissions have decreased 80 percent. The addition of the SCR also requires a higher stack. Sundance Energy's new stack height would be 85 feet above grade.

4.2.1.1 Criteria Pollutants

Under the Clean Air Act of 1970 (42 U.S.C. 7401) the EPA has set the National Ambient Air Quality Standards (NAAQS) for several criteria pollutants to protect human health and welfare (40 CFR 50). These criteria pollutants include PM_{10}, SO_2, CO, NO_2, lead (Pb), and ozone (O_3). Primary standards are adopted to protect human health. Secondary standards are adopted to protect public welfare. Arizona has adopted the federal NAAQS as indicated in Table 4-1. Enforcement of these standards is the responsibility of the Pinal County Air Quality Control District (PCAQCD).

Table 4-1
Arizona State and Federal Air Quality Standards

Pollutant	Averaging Time	Primary Standard ppm / µg/m^3	Secondary Standard ppm / µg/m^3
Nitrogen Dioxide (NO_2)	Annual	0.05 / 100	0.05 / 100
Particulate Matter (PM_{10})	24-Hour	NA / 150	NA / 150
	Annual	NA / 50	NA / 50
Carbon Monoxide (CO)	1-Hour	35 / 40,000	--
	8-Hour	9 / 10,000	--
Sulfur Dioxide (SO_2)	Annual	0.03 / 80	--
	24-hour	0.14 / 365	--
	3-hour	--	0.5 / 1,300
Ozone (O_3)	1-Hour	0.12 / 235	0.12 / 235
Lead (Pb)	Calendar Quarter	NA / 1.5	NA / 1.5
Formaldehyde(1)	1-Hour	NA / 20	--
	24-Hour	NA / 12	--
	Annual	NA / 0.08	--

Source: Arizona Department of Environmental Quality (ADEQ)
NA – Not Applicable
(1) Formaldehyde standards are Arizona Air Quality Guidelines and are used for reference, and not regulatory purposes.

Air Quality Dispersion Modeling. The Industrial Source Complex Short Term (ISCST356) dispersion model, dated 98356 (December 20, 1998) was used to predict pollutant concentrations from emissions from the proposed Facility. This model was selected as the most appropriate model to perform the air dispersion modeling analysis from continuous sources because it is designed to support the EPA regulatory modeling program and is capable of handling multiple sources, including different source types. The model estimates pollutant concentrations at receptor locations that in turn are compared with Federal and State regulatory standards to determine compliance.

The model requires turbine emission data, source parameters describing the turbine exhaust, a receptor grid identifying the locations at which the model calculates pollutant concentrations, meteorological data including surface and upper air data, and EPA regulatory default options to calculate conservative pollutant concentrations.

The proposed Facility would be a major source for nitrogen oxides (NO_x) and CO. A new source is major if it has the potential to emit any regulated pollutant in amounts equal to or exceeding 250 tons per year. PM_{10} annual emissions would be above Prevention of Significant Deterioration (PSD) significance levels, so PM_{10} also was included in the air quality analysis. SO_2 emissions would be below PSD significance levels, therefore an air quality analysis is not required for SO_2 (Greystone 2000d).

Emissions. Criteria pollutant emissions from the Sundance Energy Facility consist of startup, shutdown, and steady-state operations. For the purposes of the annual emission analysis, the following operational parameters would occur:

1,000 startup and shutdown sequences

6,500 hours at 100 percent load.

The following sections quantify the estimated annual emissions that would occur under this operational scenario.

Startup Emissions

The General Electric LM6000 SPRINT combustion turbine is capable of a rapid startup sequence to quickly respond to market demands for electrical power generation. However, the warm-up time for the SCR adds considerably to the startup time. According to the data provided by General Electric, the startup time from synchronized idle to base load is four minutes. Emissions from synchronization to full load are:

NO_x: 2.34 lbs / 4 minutes

CO: 0.27 lbs / 4 minutes

VOC: 0.07 lbs / 4 minutes

Emissions from initial fire to synchronization, a period of two minutes, are estimated to be 10 percent of the emissions from synchronization to full. Therefore, the total startup sequence emissions (without an SCR) are as follows:

NOx: (2.34 lbs * 1.1) = 2.57 lbs for 6 minutes

CO: (0.27 lbs * 1.1) = 0.297 lbs for 6 minutes

VOC: (0.07 lbs * 1.1) = 0.077 lbs for 6 minutes

At this point, the turbine is operating at its design capacity, and emissions are controlled by water injection to 25 ppmvd NO_x. An additional phase in the startup sequence is then required for the

temperature of the SCR catalyst bed to increase to an operational range. During this phase, lasting approximately 24 minutes, ammonia cannot be injected upstream of the catalyst bed because the ammonia would not react with NO_x, but would react with trace sulfur quantities to form ammonium salts. This chemical reaction can permanently and irreversibly damage the reactivity of the SCR catalyst. Therefore, during this 24-minute period, NO_x and other emissions reflect control by water injection.

The LM6000 emissions vary with ambient temperature when operating at 100 percent load. At 25 ppm NO_x emissions range from 37.1 lbs/hr at 115°F, 40.1 lbs/hr at 59°F, and 41.2 lbs/hr at 20°F. CO emissions range from 30.0 lbs/hr at 115°F, 72.8 lbs/hr at 59°F, to 131.8 lbs/hr at 20°F. VOC emissions range from 4.0 lbs/hr at 115°F, 4.3 lbs/hr at 59°F, to 4.5 lbs/hr at 20°F. Therefore, total startup emissions are calculated as follows:

NO_x: 2.57 lbs (for 6 minutes) + 24 minutes at 40.1 lbs/hr = 2.57 + 16.04 = 18.61 lbs

CO: 0.297 lbs for 6 minutes + 24 minutes at 72.8 lbs/hr = 0.297 + 29.12 = 29.42 lbs

VOC: 0.077 lbs for 6 minutes + 24 minutes at 4.3 lbs/hr = .0077 + 1.72 = 1.80 lbs

Shutdown Emissions

The shutdown sequence would involve turning off the ammonia flow, and then starting the shutdown sequence. Therefore, the time will be six minutes and the total emissions would be equal to the first phase of the startup sequence as follows:

NO_x: 2.57 lbs for 6 minutes

CO: 0.297 lbs for 6 minutes

VOC: 0.07 lbs for 6 minutes

Combined Startup, Shutdown, and 100% Load Emissions

Since a startup/shutdown sequence could occur at any time during the year, the average emissions, i.e., those emissions at the mid-range temperature, are used in this analysis. The most conservative hourly emissions could occur if a startup and shutdown occurred within the same hour. Since the startup sequence would last 30 minutes and the shutdown sequence would last six minutes, 24 minutes would remain for the turbine to operate at 100 percent load. Therefore, the total emissions for any hour of operation in which a GE LM6000 startup/shutdown occurs would be:

NOx: 18.61 lbs [Startup] + 2.57 lbs [Shutdown] + (0.4 hrs * 8.0 lbs/hr) [100% Load] = 24.38 lbs

CO: 29.42 lbs [Startup] + 0.297 lbs [Shutdown] + (0.4 hrs * 72.8 lbs/hr) [100% Load] = 58.84 lbs

VOC: 1.80 lb [Startup] + 0.07 [Shutdown] + (0.4 hrs * 4.3 lbs/hr) [100% Load] = 3.59 lbs

Estimated Facility Emissions

The hourly emissions at 100 percent load are the highest during cold temperatures and the lowest during hot temperatures. The estimated annual emissions are based on the emission factors at 100 percent load and at an ambient temperature 59ºF, near the mean annual temperature of 69ºF recorded at the Casa Grande National Monument, approximately four miles north of the proposed Sundance Energy facility. The annual emissions are based on the mean temperature because the facility may operate at any time during the year. For short-term modeling the higher hourly emission rates at the lower ambient temperature for CO were evaluated.

The PM_{10} emissions represent the "filterable" or "front-half" and the "condensable" or "back-half" PM_{10}. The DEIS and original Air Permit Application listed the estimated PM_{10} emissions as only the "front-half" filterable PM_{10} in accordance with the existing regulatory guidance in Arizona. Subsequently, the State of Arizona Department of Environmental Quality furnished guidance that PM_{10} should contain the total PM_{10}, i.e., the combination of "front-half" filterable and "back-half" condensables. A review of existing literature and emissions documentation shows that the most recently published AP-42, Section 3.1, and Emission Factors for Stationary Gas turbines (EPA 2000), PM_{10} (front-half and back-half) emission factor is 6.76 lbs/MMscf. LM6000 turbine performance data indicates an annual average high heating value of 434 MMBtu/hr. At 999 MMBtu/MMscf, the average fuel usage would be 0.434 MMscf/hr. Therefore, total particulate emissions using the EPA AP-42 emission factor are predicted to be 2.93 lbs/hr. Since this factor has not been measured for each and every type and size of combustion turbine, plus the inherent ranges of measured data, conservative estimate of total PM_{10} is to at least double this emission factor. Sundance Energy is therefore submitting 7.0 lbs/hr as a good-faith estimate of total PM_{10} emissions.

Table 4-2 verifies the expected emissions rates both in terms of lbs/hr and ppmvd @ 15% O_2.

Table 4-3 summarizes the estimated annual emissions based on the following:

- emission rates at the annual average temperature
- 6,500 hours at 100% load
- 1,000 hours when a startup and shutdown occurs

Table 4-2
Sundance Energy Estimated Hourly Emissions

	115°F 10%Relative Humidity		59°F 40% Relative Humidity		20°F 60% Relative Humidity	
Pollutant	lbs/hr	ppmvd@15% O_2	lbs/hr	ppmvd@15% O_2	lbs/hr	ppmvd@15% O_2
NO_x	7.4	5.0	8.0	5.0	8.2	5.0
CO	24.8	28.2	72.8	76.4	131.8	134.6
PM_{10}	7.0	NA	7.0	NA	7.0	NA
VOC	4.0	8.0	4.3	8.0	4.5	8.1
SO_2	0.8	NA	0.9	NA	0.9	NA

Table 4-3
Sundance Energy Estimated Annual Emissions
12 GE LM6000 Sprint Combustion Turbines
With Selective Catalytic Reduction

NO_x		**CO**		**PM_{10}**		**SO_2**		**VOC**	
Average Hourly Emissions per unit	**Annual Total (12 units)**	**Average Hourly Emissions per unit**	**Annual Total (12 units)**	**Average Hourly Emissions per unit**	**Annual Total (12 units)**	**Average Hourly Emissions per unit**	**Annual Total (12 units)**	**Average Hourly Emissions per unit**	**Annual Total (12 units)**
lbs/hr	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**	**lbs/hr**	**tons/yr**
Operating 6,500 Hours per Year at 100% Load									
8.02	312.78	72.8	2839.2	7.0	273.0	0.9	35.1	4.3	167.7
1,000 Hours per Year at 100% Load Including a Startup/Shutdown									
24.38	146.28	58.84	353.04	10.0	42.0	0.9	5.4	3.59	21.54
Annual Total	**459**		**3192**		**313**		**40**		**189**

Maximum emission rates for each of the regulatory averaging periods (1-hour, 8-hour, 24-hour, and annual) are used as input into the ISCST dispersion model to perform the dispersion analysis. The resultant maximum emission rates are shown in Table 4-4.

Source Parameters. Source parameters define the physical attributes of the exhaust from each turbine. Table 4-5 presents the source parameters used in the ISCST dispersion model.

Receptor Grid. The receptors are the locations at which the ISCST model calculates concentrations for each of the pollutants. A receptor grid at 25-meter spacing was placed around the perimeter of the proposed Site. Beyond the proposed Site boundary, additional receptors were located at 100-meter intervals out to three kilometers beyond the proposed Site boundary and at 200-meter intervals from three to 10 kilometers. Extra receptors were located in the high terrain area west to northwest of the proposed Site at 200-meter intervals.

Table 4-4
Sundance Energy Dispersion Modeling Emission Rates

Pollutant	Averaging Period	Emission Rate for each LM6000 (grams/second)
NO_x	Annual	1.101
	1-Hour	16.98
CO	8-Hour	16.98
	24-Hour	0.883
PM_{10}	Annual	0.756

Table 4-5
Sundance Energy Stack and Exhaust Modeling Parameters

Stack Parameter	LM6000 SPRINT
Stack height (meters)	25.9
Stack diameter (meters)	3.20
Exit velocity (meter/second)	34.5
Gas temperature (°Kelvin)	728

Meteorological Data. Permit regulations require the use of one year of onsite meteorological data or five years of validated data considered representative of the project location. One year of onsite data were not available, and, therefore, National Weather Service (NWS) data from Tucson, Arizona are used for model inputs. Five full years of EPA validated data was obtained for Tucson along with the upper air data from Tucson for the same period. Although Tucson is about 50 miles from the proposed Facility, the Tucson data are considered the best available and most accurate data to fully characterize the atmospheric parameters that control the dispersion of pollutants from a stationary source such as the proposed Facility.

The PCAQCD requested an evaluation of two additional sources of other wind data. The Arizona Meteorological Network (AZMET) is part of the Extension Biometeorology Program, which is a service of the University of Arizona Cooperative Extension within the College of Agriculture, collects data 3.5 miles north-northwest of the proposed Facility. Although the Coolidge AZMET data contained nearly continuous data, it was rejected for regulatory purposes. EPA regulations dictate that the wind data must be collected at a 33 feet height to partially avoid the effects of the surface features on the wind velocity and to approximate an elevation near the top of the exhaust stack where the pollutants are exhausted to the atmosphere. However, the AZMET wind data are collected at a height of 10 feet for agricultural purposes and therefore is not acceptable for PSD permitting purposes because the wind is not recorded at a height of 10 feet above the ground. The other data source was a one-year period from July 1999 to July 2000 collected at the Casa Grande Municipal Airport. Although the data are accurately collected and validated by the

PCAQCD, it is not as valid as the five-year Tucson data for the following reasons. First, the monitoring location is 15 miles west of the proposed Facility and therefore cannot be considered as onsite data. Since the PSD rules indicate that five years of data should be used, the Casa Grande data cannot be used for this PSD permit because only one year of data is available.

The ISCST model was run using the five years of meteorological data as input to estimate pollutant concentrations at receptor grid locations. The maximum concentration for each of the regulatory averaging periods is used as a conservative estimate of the pollutant concentrations from the proposed Facility.

Model Assumptions. The ISCST model assumptions are the EPA regulatory default options as follows:

- Stack tip downwash
- Final plume rise
- Buoyancy induced dispersion
- Calm processing
- Default wind profile exponents (rural) = 0.07, 0.07, 0.10, 0.15, 0.35, 0.55
- Default vertical temperature gradients = 0.0, 0.0, 0.0, 0.0, 0.02, 0.035
- Anemometer height = 10 meters

In addition, building wake effects were included in the modeling parameters in order to account for the influence of structures and buildings on the turbine exhaust plume.

ISCST Model Results. The results of the analysis are shown in Table 4-6 for each of the five years of meteorological data. The maximum annual and 24-hour impacts are predicted to occur on the high terrain northwest of the Facility on the eastern ridge of the Socaton Mountains. Modeled concentrations on Coolidge, as well as other surrounding areas generally at the same elevation as the proposed Facility, are predicted to be generally at levels less than one percent of all applicable ambient air quality standards.

Table 4-7 presents the maximum pollutant concentrations from the proposed Facility emissions as well as the maximum concentrations from monitoring locations in the surrounding community, labeled as background concentrations. The monitoring data are the best available source of criteria pollutant concentrations representing background conditions although dominated by traffic sources not present at the proposed Facility. In addition, the maximum predicted pollutant concentrations from the proposed Facility do not occur at the locations of the monitoring locations, thereby presenting a very conservative estimate of total criteria pollutant concentrations. The maximum percent of a regulatory standard is 81.1 percent for the combined proposed Facility and background concentrations for PM_{10} for the annual averaging period. This result is dominated by background concentrations measured at the monitoring station in Coolidge and not from concentrations predicted from proposed Facility emissions. In fact, the predicted Facility concentrations are less than two percent of the total annual PM_{10} concentrations.

Table 4-6
Sundance Energy Predicted Air Quality Impact

Pollutant	Averaging Period	Year of Meteorological Data				
		1987	1988	1989	1990	1991
NO_2	Annual	1.40	1.07	0.91	1.06	1.09
CO	1 hour	525	373	373	373	372
	8 hour	200	181	170	179	180
PM10	24 hour	3.86	4.74	3.30	3.65	3.26
	Annual	0.93	0.72	0.61	0.70	0.73

Table 4-7
Sundance Energy Predicted Maximum Air Quality Impacts
12 LM6000 CTs

Pollutant	Averaging Period	Ambient Standard ($\mu g/m^3$)	Maximum Facility Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Percent of Ambient Air Quality Standard
NO_2	Annual	100	1.40	58.5	59.9	59.9
CO	1 hour	40,000	525	1,710	2,235	5.6
	8 hour	10,000	200	1,482	1,682	16.8
PM_{10}	24 hour	150	4.74	83.6	88.34	58.9
	Annual	50	0.93	39.6	40.53	81.1

Hazardous Air Pollutants. Hazardous Air Pollutants (HAPS) were calculated using the AP-42 document Emission Factors for Stationary Sources, Volume I (AP-42), April 2000 (EPA 2000). Emission factors for stationary gas turbines are found in Section 3.1, Stationary gas Turbines, at the following EPA Internet site: www.epa.gov/ttn/chief/ap42/ch03/final/c03s01/c03s01.pdf. With the exception of formaldehyde, all AP-42 emission factors for HAPS from stationary gas turbines were used.

HAPS emissions were originally calculated using the California Air Resource Board California Air Toxics Emissions Factor Database (CATEP). However, subsequent research into this database revealed that emission factors for formaldehyde were 8 to 10 years old. Furthermore, no source data could be obtained from the California Air Resource Board that verified the type or size of the turbines tested, or the operational scenario. Therefore, PPL Global researched other emissions factors.

As part of the issuance of the new Section 3.1 in AP-42, the document "Emission Factor Documentation for AP-42, Section 3.1, Stationary Gas Turbines" was also issued in April, 2000. As part of the document, the author leads the reader to the database that contains all the

applicable data that was used to determine emission factors. This Access database can be downloaded from the EPA CHIEF site at www.epa.gov//ttn/chief/ap42/ch03/related/c03s01.html.

An inspection of this database shows that the formaldehyde emission factor was derived from the testing of 22 turbines (see attached output from database). A more detailed investigation of the data shows that seven of these turbines were General Electric LM aero derivative turbines. Of these seven turbines, only two apply to the Sundance Energy project. Both turbines were LM2500 turbines with water injection generating 20 to 29 MW of power. One turbine had SCR in addition to water injection. The formaldehyde emission factor is reported as 9.87×10^{-05} lb/MMBtu for the turbine with water injection. The emission factor for the turbine with both water injection and SCR was 2.50×10^{-05} lb/MMBtu. Therefore, it can be reasoned that the only available emission factor for aeroderivitive turbines is the maximum of these two factors, or 9.87×10^{-05} lb/MMBtu.

This formaldehyde emission factor is therefore used to calculate annual formaldehyde from the Sundance Energy Facility operating 7,500 hours per year. Based on this actual measured emission factor, the annual Sundance Energy formaldehyde emissions are calculated as follows:

Factor = 9.87×10^{-05} lb/MMBtu

Turbine high heating value (HHV) at annual average temperature = 434 MMBtu/hr

Hourly emissions = Factor * HHV = $9.87 \times 10^{-05} * 434 =$ 0.0428 lb/hr

Annual emissions = (0.0428 lbs/hr * 12 turbines * 7500 hr) / 2000 = 1.93 tons/yr

The Sundance Energy Facility estimated annual HAPS emissions are shown in Table 4-8.

The State of Arizona has established "ambient air quality guidelines" to list ambient concentrations of hazardous air pollutants that would be considerably potentially unhealthy. These guidelines are compared to the maximum predicted ambient concentrations from the Sundance Energy Facility. As shown in Table 4-9, most ambient concentrations are less than one percent of all applicable guidelines. The annual formaldehyde at 7.25 percent of the guideline is the only HAP over one percent of the guideline value.

The SCR process uses an aqueous ammonia solution, less than 20% ammonia and more than 80% water, for NO_x control. Annual ammonia emissions can be quantified by a comparison to the exhaust concentration and molecular weight of NO_x. Ammonia will be emitted at a maximum rate of approximately 10 ppm of the exhaust stream, and NO_x will be emitted at 5 ppm for an annual total of 459 tons. Therefore, the annual ammonia emissions are calculated as:

(Molecular weight NH_3 [17]) / Molecular weight NO_2 [46]) *

(10 ppm NH_3 / 5 ppm NO_2) * 459 tons/year = 339 tons/year ammonia

Table 4-8
Sundance Energy Hazardous Air Pollutants

Substance	CAS	Turbine Emission Rate (lbs/MMBtu) [1]	Hourly Emissions per Turbine (lbs) [1]	Annual Facility Emissions (tons) [2]
1,3-Butadiene	106-99-0	$4.3x10^{-7}$	0.0002	0.01
Acetaldehyde	75-07-0	$4.0x10^{-5}$	0.0174	0.78
Acrolein	107-02-8	$6.4x10^{-6}$	0.0028	0.12
Benzene	71-43-2	$1.2x10^{-5}$	0.0052	0.23
Formaldehyde	50-00-0	$9.87x10^{-5}$	0.0438	1.93
Naphthalene	91-20-3	$1.3x10^{-6}$	0.003056	0.03
Propylene Oxide	75-56-9	$2.9x10^{-5}$	0.01256	0.57
Toluene	108-88-3	$1.3x10^{-4}$	0.0564	2.54
Xylene (Total)	1330-20-7	$6.4x10^{-5}$	0.0278	1.25
Total				**7.46**

[1] One LM6000 turbine at 100% load : 434 MMBtu/hr annual average high heating value
[2] 12 LM6000 turbines at 100% load for 7500 hours

Ammonia Ambient Health Risk

The presumptively safe Arizona Department of Health Standards (ADHS) "Ambient Air Quality Guideline" ("AQGL") for ammonia is 140 $\mu g/m^3$ based on a 1-hour exposure. Those AQGL values do not constitute an enforceable limitation, but rather reflect exposure levels that ADHS has declared to be presumptively "safe."

To determine the maximum 1-hour ambient air concentration of ammonia, a comparison is made to the 1-hour modeling of CO for the Sundance Energy since ambient impacts using the same modeling configuration are directly proportional to the emission rate. The maximum 1-hour CO impact was 525 $\mu g/m^3$ with a 1-hour maximum emission rate of 16.987 grams/second from each of the 12 turbines. Based on an annual ammonia emission rate of 339 tons, the 1-hour emission rate would be 0.814 grams/sec for each of the 12 turbines. Therefore, the maximum ground level ammonia ambient concentration would be:

$$(16.987 / 0.814) * 525 = 25.1\ \mu g/m^3$$

The maximum one-hour exposure would be 25.1 $\mu g/m^3$, or 17.9 percent of the exposure level that ADHS has determined to be presumptively “safe”. Since the predicted maximum 1-hour concentration is well below the established health guideline, it can be concluded that ambient ammonia concentrations would not present a hazard to the public health.

Table 4-9
Sundance Energy Predicted HAPS Ambient Impacts

HAP	Averaging Period	AAAG (mg/m^3)	Sundance Predicted Concentration (mg/m^3)	Sundance Percent of AAAG
1,3-Butadiene	1-hour	7.2	0.00073	0.01014
	24-hour	1.9	0.000126	0.006663
	Annual	0.67	0.0000253	0.00378
Acetaldehyde	1-hour	2300	0.0677	0.00294
	24-hour	1400	0.0117	0.00084
	Annual	0.5	0.00235	0.47000
Acrolein	1-hour	6.7	0.0108	0.16119
	24-hour	2.0	0.00187	0.09350
Benzene	1-hour	630	0.0203	0.00322
	24-hour	51	0.00351	0.00688
	Annual	0.14	0.000705	0.50357
Formaldehyde	1-hour	20	0.167	0.83500
	24-hour	12	0.0289	0.24083
	Annual	0.08	0.0058	7.25000
Naphthalene	1-hour	630	0.00220	0.00035
	24-hour	400	0.000381	0.00010
Propylene Oxide	1-hour	1500	0.0491	0.00327
	24-hour	400	0.00849	0.00212
	Annual	2.0	0.00171	0.08550
Toluene	1-hour	4700	0.219	0.00466
	24-hour	3000	0.0381	0.00127
Xylene	1-hour	5500	0.1083	0.00197
	24-hour	3500	0.0187	0.00053

PSD Analysis. The proposed Facility would be a major PSD source for NO_x and CO. A new source is major if it has the potential to emit any regulated pollutant in amounts equal to or exceeding 250 tons per year. The proposed Facility therefore would be subject to the Federal New Source Performance Standards for stationary gas turbines (40CFR Part 60 Subpart GG). Emissions of particulates (PM_{10}) and volatile organic compounds (VOCs) also exceed the PSD significance level and require a PSD review. Table 4-10 presents the PSD significant concentrations for criteria pollutants.

The PCAQCD Code of Regulations Section 2-5-190 states that: "For new major sources and major modifications located in, and which would establish the minor source baseline date, Pinal County, the baseline area shall be the Central Arizona Intrastate Air Quality Control Region, as designated by the Administrator at 40 CFR 81.271 (7/1/93) and comprising Pinal and Gila counties, at least insofar as any portion of that region is designated as attainment or unclassifiable for the pollutant for which the minor source baseline date is established." The baseline area shall also extend to any other air quality control region located in Arizona in which such a source, establishing a minor source baseline date in Pinal County, would have an air quality impact equal to or greater than one microgram per cubic meter (µg/m^3) (annual average) of the pollutant for which the minor source baseline date is established.

Table 4-10
PSD Air Quality Significant Concentrations

Pollutant	Averaging Time	Class II Increment ($\mu g/m^3$)	Significant Impact Concentration ($\mu g/m^3$)	Monitoring de Minimus ($\mu g/m^3$)
NO_2	Annual	25	1	14
CO	1-Hour	NA	2,000	NA
	8-Hour	NA	500	575
PM_{10}	24-Hour	30	5	10
	Annual	17	1	NA

NA – Not Applicable

The proposed Facility NO_x air quality impact area, greater than one $\mu g/m^3$, is a small area on the higher terrain to the west and northwest of the proposed Facility. The NO_2 major source baseline date is established as February 8, 1988.

All significant stationary minor sources of NO_x within 50 kilometers of the Project were analyzed to determine the existing ambient air quality in the area where the proposed Facility impacts exceeded the NO_x significant level of one $\mu g/m^3$. Permit records and emission inventories were obtained from the PCAQCD to determine significant NO_x sources within 50 kilometers of the proposed Facility. All stationary sources with annual NO_x emissions in excess of 10 tons per year were considered to potentially affect the NO_2 increment consumption and were included in the analysis. Table 4-11 lists the sources evaluated in the PSD Class II increment analysis. This is a very conservative approach to an increment consumption analysis because all sources, regardless of whether they began operating before the NO_2 baseline was triggered, were considered in the analysis.

These sources were included with the proposed Facility emissions using the ISCST dispersion model with the 1987 meteorology, for which impacts were the greatest. The results of the analysis indicated that the maximum impact from all sources is predicted to increase to 1.47 $\mu g/m^3$, or 0.07 $\mu g/m^3$ higher than the 1.40 $\mu g/m^3$ modeled for the Sundance Facility only. Therefore, the PSD Class II increment consumption would be 1.47 $\mu g/m^3$, or 5.9 percent of the available increment of 25 $\mu g/m^3$.

Table 4-11
NO_x Sources Evaluated for PSD Class II Increment Consumption Analysis

Source	Location		Elevation (m)	Emissions (gm/sec)	Stack Height (m)	Exhaust Temperature (K)	Exhaust Velocity (m/sec)	Stack Inside Diameter (m)	Distance from Sundance Energy (km)
	UTM E	UTM N							
Abbott Laboratories	426156	3639754	424	0.631	18.3	411	10.7	0.91	19.1
El Paso Casa Grande Compressor Station	400516	3643869	410	6.561	18.3	576	30.7	1.8	44.3
Hexcel Corporation	426715	3638086	421	0.503	5.2	422	3.6	0.43	18.9
Mayville Metal Products	427393	3638297	422	0.484	18.3	411	10.7	0.91	18.2
Recot	425823	3640434	425	0.469	15.2	548	10.9	1.07	19.3
Salt River Sand and Rock	455561	3654945	435	1.468	3.1	795	59.4	0.13	15.6
United Metro	425083	3635752	417	0.432	7.0	400	57.2	0.15	21.2
Owens Corning Corporation	442169	3614302	487	0.616	18.3	411	10.7	0.91	29.4
Reliant Energy	426246	3640691	416	5.4	48.8	351	15.9	5.94	18.8
US West Casa Grande	442962	3696495	457	1.828	7.3	700	36.3	0.31	52.9

Source: Greystone 2000d.

Air Quality Related Values. For PSD sources, potential impacts to air quality and air quality related values must be evaluated if a proposed source is located within 100 kilometers of a designated Class I airshed. Two Class I airsheds are located within 100 kilometers of the proposed Facility. The closest boundary of the U.S. Forest Service Superstition Wilderness is about 57 kilometers north-northeast. The closest boundary of the National Park Service West Saguaro Park is located about 75 kilometers south-southeast. Modeling using the CALMET/CALPUFF dispersion model was performed to predict visibility and deposition impacts at the two Class I areas near the proposed Facility (Greystone 2000d).

Ambient Air Impacts. PSD regulations require an evaluation of a proposed Facility's potential impact on Class I areas. The ISCST356 dispersion model was run using the five years of Tucson data to evaluate NO_x and PM_{10} ambient air concentrations at the U.S. Forest Service Superstition Wilderness and the Saguaro West National Park. The concentrations are then compared to the PSD Class I increments to determine whether significant air quality deterioration would be

predicted to occur. As shown in Table 4-12, the ambient concentration of NO_x and PM_{10} would be less than three percent of allowable increases.

Table 4-12
Sundance Energy Predicted Maximum Air Quality Impacts at Superstition Wilderness and Saguaro West National Park

Pollutant	Averaging Period	Maximum Concentration ($\mu g/m^3$)	Class I Increment ($\mu g/m^3$)	Percent of Class I Increment	Exceeds Class I Increment
NO_2	Annual	0.032	2.5	1.3	NO
PM_{10}	24 hour	0.237	8.0	3.0	NO
	Annual	0.022	4.0	0.6	NO

Visibility. As a result of the decrease in NO_x emissions, the inclusion of total PM_{10} rather than filterable front-half, the quantification of startup and shutdown emissions, and the changed stack height, a reanalysis of potential impacts to Class I areas was completed.

The Class I analysis using the CALPUFF/CALMET dispersion model requires input emission rates based upon the maximum emissions expected in a 24-hour period. To calculate the maximum 24-hour emissions, it is assumed that three startup/shutdown sequences could occur in a 24-hour period.

Since the PM_{10} and SO_2 emissions are identical for startups, shutdown, and steady-state operation, the 24 hours emissions from each LM6000 turbines are simply the hourly rate of 7.0 lbs/hr for PM_{10} and 0.9 lbs/hr for SO_2.

NO_x emissions are calculated in the following manner:

Three hours with a startup/shutdown and 24 minutes 100% load.

NOx: 18.61 lbs [Startup] + 2.57 lbs [Shutdown] + (0.4 hrs * 8.0 lbs/hr) [100% Load] = 24.38 lbs;

Remaining 21 hours at 100% load at 8.0 lbs/hr annual average:

24-hour total = (24.38 lbs/hr * 3 hrs) + (8.0 lbs/hr * 21 hours) = 241.14 lbs/24 hours = 10.05 lbs/hr = 1.267 gm/sec for each turbine or 15.204 gm/sec for 12 turbines.

PM_{10} = 7.0 lbs/hr = 0.882 gm/sec = 10.584 gm/sec for 12 turbines.

SO_2 = 0.9 lbs/hr = 0.114 gm/sec = 1.368 gm/sec for 12 turbines.

The results of the analysis, shown in Table 4-13, demonstrate that the maximum visibility reduction is predicted to be below 5.0 percent. Therefore, according to the procedures developed by the Federal Land Managers (Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report, December 2000), the Sundance Energy Facility will not have an adverse effect on visibility in the Class I areas nearby.

Table 4-13
Visibility Impacts at Class I Areas
Near Sundance Energy

	Maximum 24-Hour Visibility Reduction (%)	
Month	**Superstition Wilderness**	**Saguaro West National Park**
January	2.24	3.13
February	2.62	1.19
March	2.85	0.93
April	1.24	0.32
May	1.06	0.13
June	0.80	0.40
July	1.16	0.12
August	1.67	0.32
September	0.92	0.35
October	0.98	0.30
November	2.36	0.45
December	3.58	2.94

The Pinal County Air Quality Control District requested an additional analysis of potential visibility effects at the BLM Class II airshed Table Top Wilderness. This analysis was completed using the CALPUFF dispersion model in the screening mode. Per FLAG directions, five years of Tucson data were used. The results of the visibility impact analysis are shown in Table 4-14.

Table 4-14
Visibility Impacts at BLM Class II Table Top Wilderness

Modeled Year	**Number 24-Hour Periods When Visibility Reduction Predicted to Exceed 5 Percent**	**Maximum Percentage of Visibility Reduction (%)**
1984	15	7.70
1985	19	7.93
1986	21	7.82
1987	28	8.00
1988	18	8.38

Casa Grande National Monument Impacts. At the request of the National Park Service for both the Sundance Energy PSD/Title V permit application and the Sundance Energy Environmental Impact Statement process, an Air Quality Related Values (AQRV) analysis was performed for the Casa Grande National Monument in Coolidge, approximately four miles north of the Sundance Energy proposed Facility. The analysis was performed using the same CALPUFF/CALMET procedures described for the mandatory PSD AQRV analysis for the Class I Superstition Wilderness and the Saguaro West National Park.

The results of the analysis, shown in Table 4-15, demonstrate that the maximum visibility reduction is predicted to be 7.7 percent for one 24-hour period in February for the full year modeling analysis. Although one 24-period in February exceeded five percent, the next highest 24-hour visibility reduction in February was 2.75 percent. Therefore, according to the procedures developed by the Federal Land Managers (Federal Land Managers' Air Quality

Related Values Workgroup (FLAG) Phase I Report, December 2000), the Sundance Energy Facility will not have an adverse effect on visibility at the Casa Grande National Monument.

Table 4-15
Visibility Impacts at Casa Grande National Monument

Month	Maximum 24-Hour Visibility Reduction (%)
January	2.81
February	7.73 – next highest 2.75
March	3.98
April	3.88
May	4.05
June	2.43
July	1.66
August	2.02
September	3.11
October	1.73
November	2.66
December	3.69

Acid Deposition. Table 4-16 presents the predicted acid deposition (as elemental nitrogen and sulfur) at the two Class I areas. These impacts are related to the dry and wet deposition of nitric acid, NO_3, NO_x, SO_2, and SO_4. In general, wet deposition at the Superstition Wilderness was slightly greater than dry deposition, while at Saguaro West National Park dry deposition was slightly greater than wet deposition (Greystone 2000d).

Table 4-16
Acid Deposition Impacts at Class I Areas

	Superstition Wilderness		Saguaro West National Park	
Month	Average 24-Hour Nitrogen Deposition (kg/hectare/24 hours)	Average 24-Hour Sulfur Deposition (kg/hectare/24 hours)	Average 24-Hour Nitrogen Deposition (kg/hectare/24 hours)	Average 24-Hour Sulfur Deposition (kg/hectare/24 hours)
January	4.47×10^{-4}	3.32×10^{-5}	3.57×10^{-5}	1.50×10^{-6}
February	6.51×10^{-4}	2.66×10^{-5}	3.25×10^{-5}	1.31×10^{-6}
March	9.73×10^{-4}	2.26×10^{-5}	9.16×10^{-5}	3.19×10^{-6}
April	6.13×10^{-4}	1.74×10^{-5}	1.11×10^{-4}	2.80×10^{-6}
May	3.64×10^{-4}	1.09×10^{-5}	3.70×10^{-5}	9.63×10^{-7}
June	3.12×10^{-4}	8.85×10^{-6}	1.79×10^{-4}	4.00×10^{-6}
July	6.51×10^{-4}	2.97×10^{-5}	1.89×10^{-4}	1.90×10^{-5}
August	1.92×10^{-4}	6.41×10^{-5}	1.74×10^{-4}	1.21×10^{-5}
September	4.16×10^{-3}	1.00×10^{-4}	2.81×10^{-4}	2.13×10^{-5}
October	3.94×10^{-4}	1.37×10^{-5}	3.26×10^{-5}	1.14×10^{-6}
November	1.00×10^{-3}	2.13×10^{-5}	7.73×10^{-5}	2.05×10^{-6}
December	5.94×10^{-4}	2.23×10^{-5}	4.28×10^{-5}	3.61×10^{-6}
Annual Monthly Maximum	4.16×10^{-3}	1.00×10^{-4}	2.81×10^{-4}	2.13×10^{-5}

Source: Greystone 2000d.

In addition to a visibility analysis, acid deposition (wet and dry) of sulfur and nitrogen was also calculated at the Casa Grande National Monument using the procedures described in the aforementioned FLAG document. The results of the analysis are shown in Table 4-17.

Table 4-17
Deposition at Casa Grande National Monument

	Maximum 24-Hour Deposition (kilograms/hectare)	
Month	**Nitrogen**	**Sulfur**
January	0.00723	0.00059
February	0.00413	0.00040
March	0.00227	0.00029
April	0.00131	0.00025
May	0.00117	0.00014
June	0.00364	0.00024
July	0.00253	0.00028
August	0.00300	0.00041
September	0.00537	0.00042
October	0.00031	0.00005
November	0.00284	0.00022
December	0.00169	0.00013

Conclusion. Air quality impacts from construction or operation of the proposed Facility would be minimal with respect to criteria and hazardous air pollutants, adding only a small incremental contribution to existing air quality. The average 24-hour PM_{10} increment resulting from facility operation would be 3.16 percent of the regulatory standard, representing the maximum criteria air pollutant contribution from the facility as a percent of the standard. The maximum one-hour exposure of ammonia would be approximately 18 percent of the exposure level that ADHS has determined to be presumptively "safe". The average annual formaldehyde concentration, as measured against Arizona Air Quality Guidelines, would be 7.25 percent of the hazardous pollutant guideline. The maximum PSD Class II increment consumption in the significance area would be 5.9 percent of the NO_2 PSD Class II increment, therefore consuming a minimal portion of the increment. Visibility impacts in the Class I airsheds would be less than five percent.

4.2.2 Pipelines

Fugitive dust emissions would result from construction along the pipeline ROW. Emissions during construction would be associated with land clearing, drilling, excavation, and earth moving. Dust emissions often vary substantially from day to day, depending on the level of activity, the specific operation, and the prevailing meteorological conditions. A large portion of the fugitive dust emissions would result from construction equipment traffic along the ROW. Construction along the ROW would result in dust emissions that may have a temporary adverse impact on the local air quality. These impacts are comparable to the current agricultural activity ongoing in the area.

4.2.3 Transmission Lines

Fugitive dust emissions would result from construction along the transmission line ROW. Emissions during construction would be associated with land clearing, drilling, excavation, and earth moving. Dust emissions often vary substantially from day to day, depending on the level of activity, the specific operation, and the prevailing meteorological conditions. A large portion of the fugitive dust emissions would result from construction equipment traffic along the ROW. Construction along the ROW would result in dust emissions that may have a temporary adverse impact on the local air quality. These impacts are comparable to the current agricultural activity ongoing in the area. As part of the mitigation of transmission line construction impacts, all construction vehicle movement outside the ROW would be restricted to predesignated access, contractor-acquired access or public roads. All requirements of those entities having jurisdiction over air quality matters would be adhered to and any permits need for construction activities would be obtained.

Table 4-17
CAP Water Quality and Predicted Wastewater Quality

	Calcium	Chloride	Copper	Iron	Magnesium	Manganese	Sulfate	TDS
Maximum	74.2	82.0	<0.01	0.11	28.2	0.03	252	560
Predicted Maximum for Wastewater Pond[1]	371.0	410.0	<0.05	0.55	141.0	0.15	1260	2800
Predicted Water Quality in Blended Wastewater[2]	272.1	300.7	<0.04	0.40	103.4	0.11	924.0	2053.3
Groundwater[3]	NA[4]	735	NA	NA	72.0	NA	669	2752
Secondary Drinking Water Maximum Contaminant Levels[5]	None	250	1.0	0.3	None	0.05	250	500

[1] Assumes all constituents from inflow CAP are in 20% volume of RO outflow
[2] Blended water quality based on 2 parts RO water + 1 part CAP water
[3] DEIS, Table 3-4
[4] Not Analyzed
[5] 40 CFR 143.3

4.8 CULTURAL RESOURCES

This section discusses the potential effects of the construction and operation of the proposed Project and alternatives on cultural resources at the proposed Site, transmission lines, and pipeline as well as the surrounding areas. Potential impacts were assessed by evaluating existing cultural resource studies, as well as conducting an additional archaeological survey of previously un-surveyed land for the proposed transmission lines (Northland 2001). Specifically, proposed Site file searches were completed at appropriate institutions (e.g., Arizona State Museum, Arizona State Historic Preservation Office, and Bureau of Land Management) to determine the potential for cultural resources occurring within the proposed Project area. No cultural properties eligible or potentially eligible for inclusion on the NRHP were identified within the proposed Facility area. Western has consulted with seven interested Tribes regarding both the proposed Facility and transmission line routes (see Section 3.8). Prior to any construction, Western would also consult with the State Historic Preservation Office, Advisory Council, and Arizona State Museum to make sure all cultural resources in the proposed Project area are handled appropriately.

Construction of the proposed Site, the transmission lines, and the pipeline (including ROWs and access roads) has the potential to adversely impact cultural resources (prehistoric, historic or modern) or result in their discovery. Avoidance of any known or newly discovered cultural resources is the recommended primary means of mitigation. However, if avoidance is not possible it would be necessary to develop and implement data recovery plans in order to mitigate potential adverse effects. Two large prehistoric (Hohokam) canal systems, the Pinkley Canal and the Casa Grande Canal, as well as numerous historic water delivery systems would be crossed by the proposed transmission lines. Further investigation of the historical significance and the exact locations of these facilities would be determined before construction begins.

Western is required to comply with the following Executive Orders, Executive Order 13007: Protection and Accommodation of Access to Indian Sacred Sites, and Executive Order 13084: Consultation and Coordination With Indian Tribal Governments, in addition to the statutes and regulations listed in Table 5-1 in the Sundance Energy Project DEIS.

4.8.1 Facilities

The proposed Site was surveyed for cultural resources in 1985, 1999 and 2001, and no significant historic properties were found (Greystone 2000e, Slawson 1999).

4.8.2 Pipelines

The proposed pipeline corridor parallels an existing El Paso pipeline and crosses through arid plains away from major rivers. Modern agriculture in this area is maintained by irrigation systems. Any inventories of the existing pipeline ROW would be reviewed, and any areas of potential disturbance that have not been adequately covered by previous investigations would be inventoried prior to construction. Judging from the results of past investigations in the general area, there is a low potential for significant historic or prehistoric sites along the corridor (Greystone 2000e). However, 27 irrigation ditches would be crossed by the proposed pipeline,

and the historical significance of each ditch would need to be determined prior to construction. Plans to avoid adversely impacting any feature determined to be of historical significance would need to be explicitly stated. Mitigation may include detailed historical documentation including date of construction, historical association [person, canal system] and photodocumentation.

The proposed Project would tie into El Paso Natural Gas Company's 2000 Line after it has been converted from oil to a natural gas line pipeline. The El Paso 2000 Line was formerly owned by the All American Pipeline Corporation and was surveyed and mitigated for archaeological impacts on its construction in the 1980s (Ackerly et al. 1989; Northland 2000).

4.8.3 Transmission Lines

The construction of the proposed transmission line also has the potential to impact cultural resources, including significant prehistoric and historic canals, as well as prehistoric habitation and limited activity sites. If possible, transmission line support poles and towers should be place to avoid any known cultural resources. Construction may result in the discovery of previously unidentified cultural resources. If a discovery is made, work at the site of the discovery should stop until it can be evaluated by a professional cultural resource specialist who should then make recommendations regarding the disposition of the discovery. Those recommendations could include avoidance, removal (in the case of human burials), or further investigation (data recovery). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a mitigation plan would be developed in consultation with the SHPO and interested tribes.

4.8.3.1 Proposed Action

An intensive cultural resource inventory has not yet been completed for the proposed transmission lines and associated facilities or for the proposed transmission line upgrades (Northland 2001). The actual areas of disturbance involved in transmission line upgrades are limited in extent and it should be feasible to avoid or limit impact to identified historic or prehistoric properties. The new transmission lines and Signal Substation would likely entail more ground disturbance, but are located in areas containing fewer significant historic properties (Greystone 2000e, Northland 2001). Monitoring of transmission line construction by a trained cultural resource specialist is necessary to avoid impacts to archaeological sites. The Proposed Action could potentially affect sites AZ AA:2:30 and U:14:108 which are both recommended as eligible for inclusion in the NRHP. In addition, the Proposed Action may impact potentially eligible sites: AZ AA:2:203 and AA:2:204 (both prehistoric limited activity sites) and AA:2:130 (Pima Lateral Canal, a historic concrete-lined canal). There is a high potential for the presence of significant prehistoric canals where the Proposed Action passes nearest to Casa Grande Ruins National Monument (Northland 2001). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a mitigation plan would be developed in consultation with the SHPO and interested tribes.

4.8.3.2 Alternative 1

In terms of known cultural resources, Alternative 1 does not differ appreciably from the Proposed Action. Adding a third 230-kV line to the north from the proposed Site may slightly alter the extent of disturbance in some areas, but would not alter where that disturbance may occur. The differences in Alternative 1 in Section 19 are not in an area of currently known historic properties and the anticipated effects are comparable to the Proposed Action. However, Alternative 1 includes a re-routing of the existing Coolidge-Signal 115-kV line from this point in Section 19 to the Coolidge Substation and replacement of existing wooden H-frame structures with double-circuit tubular steel pole structures. The areas of disturbance are near the Gila River and the Casa Grande Ruins National Monument, where there is a high potential for the presence of potentially significant historic and prehistoric cultural resources. There is a high potential for the presence of significant prehistoric canals where Alternative 1 passes nearest to Casa Grande Ruins National Monument (Northland 2001).

Alternative 1 would potentially affect sites AZ AA:2:30 and U:14:108 which are recommended as eligible for inclusion in the NRHP and AA:2:130 which is the potentially NRHP-eligible Pima Lateral historic concrete-lined canal. Alternative 1 may also affect the ineligible historic sites AA:2:127 (Betchel Road) and AA:6:63 (State Route 87) (Northland 2001). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a treatment plan would be developed in consultation with the SHPO and interested tribes.

4.8.3.3 Alternative 2

In terms of potential effects to known or undocumented cultural resources, Alternative 2 is essentially the same as Alternative 1. Both alternatives are estimated to increase surface disturbance by about 34 acres more than the Proposed Action, but this estimate does not include disturbance that can impact cultural resources, such as temporary access, and staging and storage areas. There is a high potential for the presence of significant prehistoric canals where Alternative 2 passes nearest to Casa Grande Ruins National Monument (Northland 2001).

Alternative 2 would potentially affect sites AZ AA:2:30 and U:14:108 which are recommended as eligibile for inclusion in the NRHP and AA:2:130 which is the potentially NRHP-eligible Pima Lateral historic concrete-lined canal. Alternative 2 may also affect the ineligible historic sites AA:2:127 (Betchel Road) and AA:6:63 (State Route 87) (Northland 2001). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a mitigation plan would be developed in consultation with the SHPO and interested tribes.

4.8.3.4 Alternative 3

Shortly after the issuance of the Sundance Energy Project DEIS, Alternative 3 was identified as the preferred routing. Subsequently, pedestrian survey for cultural resources was initiated. Alternative 3 would re-route the existing Coolidge-Signal 115-kV line from this point in Section 19 to the Coolidge Substation and replace existing wooden H-frame structures with double-

circuit tubular steel pole structures. The areas of disturbance are near the Gila River and the Casa Grande Ruins National Monument, where there is a high potential for the presence of potentially significant historic and prehistoric cultural resources. All areas of potential direct or indirect effect would be inventoried for cultural resources, including significant prehistoric canal systems (Northland 2001).

The Alternative 3 Route would potentially affect sites AZ AA:2:200, AA:2:30 and U:14:108 which are all prehistoric sites recommended as eligible for inclusion in the NRHP and potentially eligible sites: AZ AA:2:201, AA:2:129 and AA:2:130 (one prehistoric limited activity site, and two concrete-lined historic canals, the Pima Lateral and the Southside Canal). Alternative 3 may also affect the ineligible historic sites AZ AA:2:207, AA:2:208, AA:2:209, AA:2:210, AA:2:127 (Betchel Road), AA:6:63 (State Route 87) and Field Site 3 (Northland 2001) (Northland 2001). All archaeological sites determined significant in consultation with the SHPO and interested tribes would be avoided. If they cannot be avoided, a mitigation plan would be developed in consultation with the SHPO and interested tribes.

4.13 CUMULATIVE IMPACTS

This section describes the potential cumulative impacts of the Proposed Action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The section includes the methods of analysis and a summary of the cumulative impacts by resource area.

4.13.1 Introduction

The Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of the NEPA define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" [40 Code of Federal Regulations (CFR) Part 1508.7]. The regulations further explain that "cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." The cumulative effects analysis presented in this EIS are based on the potential effects of construction and operation of the proposed Project and the interconnection to Western's transmission system when added to common issues and their effects in the ROIs for each resource resulting from past, present, and reasonably foreseeable future actions.

4.13.2 Methods of Analysis

The cumulative effects were assessed by combining three elements: anticipated activities by Sundance, anticipated activities by Western, and other anticipated projects and activities (primarily in Pinal County). Anticipated proposed Project activities are summarized from the detailed discussions in Chapters 1 through 4. There are no plans to upgrade the Coolidge-Rogers Line in Western's current Ten-Year Plan. However, during negotiations on renewing the lease for the Coolidge-Rogers transmission line across the Gila River Indian Reservation, the potential for upgrades to the line was discussed. In addition, a potential upgrade to the Coolidge-Rogers Line was mentioned, during the scoping meeting for the proposed Project.

It has been determined that an upgrade to the Coolidge-Rogers Line is not needed at this time to provide transmission capacity for the proposed Project. Since the potential upgrade has been the subject of public discussion, the cumulative impacts of an upgrade to the Coolidge-Rogers Line are included below. If, in the future, the upgrade of the 230-kV Coolidge-Rogers Line is again proposed, the proposal would be evaluated through the NEPA compliance process.

Actions by others in the region include the construction and operation of the Reliant Energy Power Plant and the conversion of the former All American pipeline from oil to natural gas. Since construction of the Reliant Energy Power Plant has already begun, the project impacts were included in as part of the Affected Environment evaluated in Chapter 3 of this EIS.

Two other power stations could soon be operating in Pinal County. The Desert Basin Generating Station in Casa Grande, Arizona, is a 563 megawatt natural gas-fired merchant power plant that is scheduled to be producing by the summer of 2001. The Toltec Power Station is a proposed 2,000-megawatt, natural-gas-fired power plant in southern Pinal County. The Toltec Power Station is scheduled to begin generating by the beginning of 2007.

According to the California Energy Commission, there are 18 power plant proposed for southern central Arizona (Maricopa and Pinal counties). Not all of these proposed facilities may be built. The environmental information gathering process for these facilities is mostly in the beginning stages. While these power stations would be required to meet all environmental standards and regulations, the large number of power stations in the two county area could have significant impacts to air quality and water use.

Two of the landowners in the vicinity of the proposed Project area have informed Western of their intentions to develop their land from agricultural use into housing subdivisions. One of the landowners has begun the zoning change process with the Pinal County Board of Supervisors.

4.13.3 Cumulative Impacts by Resource Area

A summary of the cumulative impacts of the Proposed Action and alternatives is shown in Table 4-19.

4.14 UNAVOIDABLE ADVERSE IMPACTS

The construction and operation of the Proposed Action or any of the alternatives would result in some unavoidable adverse impacts. Impacts to residential areas located near the proposed facilities during construction would include increases in daytime noise and fugitive dust, as well as traffic detours. Since these impacts are associated with the construction phase, they are short-term and temporary. Residences closest to the proposed Facility could experience an increase in noise of up to 10 dBA above the measured background noise level from the operation of the proposed Facility. This level of change in sound levels may be perceived as “dramatic” by these residents.

The generation of energy using gas turbines would cause unavoidable emissions of air pollutants that can be considered an adverse impact. Computer modeling shows that maximum concentrations of most pollutants would occur on the high terrain to the west and northwest of the proposed Facility on the eastern ridges or the Sacaton Mountains. However, these concentrations are expected to be well below applicable ambient air quality standards.

Construction and operation of the proposed Facility would result in the generation of small quantities of solid and hazardous wastes that could decrease the life of existing landfills and increase shipments to RCRA-permitted treatment and disposal facilities, respectively.

Construction of the pipeline would adversely impact about 124 acres of prime farmland soils. This would include compaction of these soils and damaging the soil structure during excavation.

In addition, increases in soil erosion could occur as a result of construction of all of the proposed facilities.

Construction and operation of the proposed Facility would cause loss and/or disturbance to existing native plant communities and loss of habitat for terrestrial animal populations. Cultural resources present in the affected areas could be adversely impacted by construction of the proposed Facility. Surveys conducted prior to construction would aid in mitigating these impacts. Affects that can be avoided would be mitigated through data recovery.

Since the view from nearby roads is of cropland and undisturbed areas, the proposed Facility exhaust stacks, either two at 100-foot and six at 60-foot tall or 12 at 60-foot tall, could considered to be an adverse impact on the viewshed to travelers on the nearby roads. The construction of new transmission towers could have a similar effect.

Table 4-19
Cumulative Impacts

Affected Environment	Proposed Action	Other Projects in Area
LAND USE	No long-term impacts related to siting, construction, and operation of the proposed Facility. No impacts to land status and land uses from proposed Facility construction and operation Short-term impacts are increased daytime noise and dust, the presence of crew and equipment and obstruction of traffic at crossings during construction. Access road would be constructed on proposed Site. No disruption to land uses from access road construction. Pipeline construction on agricultural land would cause temporary loss of crops on construction ROW. Crop yields reduced for 1 to 2 years following construction. Short-term affects would include traffic detours during construction. No impacts to existing land status and land uses from transmission line construction and operation. No impacts to recreational uses are expected. Short-term affects would include obstruction of traffic at road crossings and maintenance activities.	**Coolidge-Rogers** Wherever possible, access to each structure and the ROW would be by existing roads and trails. Much of the reconductoring on the line would be built onto the existing line. **All American Pipeline** The conversion of the pipeline from oil to natural gas would not involve new ROW and would not have impacts on land use. **Housing Subdivisions** The rezoning of the land from agricultural to residential could be approved whether or not the proposed Project is implemented. There could be potential conflicts over ROWs as infrastructure in the area is improved.
AIR QUALITY	No significant air quality impacts are expected in the proposed Project area. Emissions of criteria pollutants, PM_{10}, SO_2, CO, NO_2, and VOCs are expected to be negligible and less than one percent of all applicable ambient air quality standards. Hazardous air pollutants from the combustion of natural gas during operation are expected to be below AAAQG. Two visual impacts greater than 5 percent are predicted to occur in the Class I airshed, Superstition Wilderness, in December and March. Acid deposition impacts are predicted at two Class I airsheds, Superstition Wilderness and Saguaro West National Park.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line is expected to have no impacts on air quality. **All American Pipeline** The conversion of the pipeline from oil to natural gas would require the use of new compressor stations along the line. At this time, it is not anticipated that a compressor station would be built in the area. **Housing Subdivisions** If the proposed housing subdivisions were to be built and the proposed Project implemented, there would be more potential receptors for air pollutants from the proposed Facility. Modeling of the air

Table 4-19
Cumulative Impacts (continued)

Affected Environment	Proposed Action	Other Projects in Area
AIR QUALITY (continued)	Fugitive dust emission impacts are expected from pipeline and transmission line construction activities.	impacts shows that stack height precludes much of the impacts from the immediate vicinity of the proposed Facility.
NOISE	Noise emission levels ranging from 93-108 dBA at the source during construction and from 63-85 dBA during operation are expected. Noise level diminishes with distance from the proposed Site. Those residences closest to the proposed Facility could experience an increase in noise from operation of the proposed Facility equivalent to a residential air conditioner at 50 feet. Noise emission levels from pipeline and transmission line construction are expected to range from 40-45 dBA during daytime hours. Construction noise would be at each 1-mile interval of construction.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would involve noise due to construction activities. Activities would not take place at same place or same time as the proposed Project activities. **All American Pipeline** The conversion of the pipeline would involve noise due to construction activities. Activities would not take place at same place or same time as the proposed Project activities. **Housing Subdivisions** Development of some of the nearby parcels of agricultural land into housing subdivisions will have several cumulative noise impacts. The development would likely increase both daytime and nighttime background noise levels whether or not the proposed Project is built. While, there would be more people nearby to experience noise from the proposed Facility, the increase in background noise would make the noise from the proposed Facility relatively less noticeable.
INFRASTRUCTURE/WASTE MANAGEMENT	No substantial impact from the proposed Facility infrastructure to local area power supplies or natural gas supply is anticipated. Potential contamination hazard from the storage and use of fuel, lubricants, and other fluids during construction of the proposed Facility, pipelines, transmission lines, and access road. Impacts would be minimized by the restriction of refueling activities from dry washes and by requiring immediate cleanup of spills and leaks. No significant affects to municipal solid waste facilities related to the generation of solid waste.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would have no impacts to infrastructure or waste management. **All American Pipeline** The conversion of the pipeline would have no impacts to infrastructure or waste management. **Housing Subdivisions** There could be conflict over ROWs for increased infrastructure should the residential areas be constructed.

Table 4-19
Cumulative Impacts (continued)

Affected Environment	Proposed Action	Other Projects in Area
WATER RESOURCES	Minimal impacts to other users are anticipated from groundwater usage by the proposed Facility. Groundwater pumping is expected to have minimal impact on the Pinal AMA aquifer. No subsidence is anticipated from groundwater pumping. No impact to groundwater quality is expected from the proposed Facility construction and operation activities. No impacts from proposed Facility construction and operation are expected to other users of CAP water. The proposed Facility usage is expected to help defray operation and maintenance costs of CAP system. No impacts expected from the extraction of CAP water. Potential contamination from storage and use of fuels, lubricants, fluids, and chemicals during the proposed Facility construction and operation. Increased runoff is anticipated during pipeline and transmission line construction related to storms and large flow events in disturbed areas. Potential for increased erosion, sedimentation, turbidity, release of chemical and nutrient pollutants; and introduction of chemical contamination from fuels and lubricants. No impacts are anticipated from the design of the stormwater disposal dikes due to implementation of SPCC plans. No impacts are expected from the use of effluent water for agriculture.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would not contribute to water usage in the area. There would be no significant impact to the Gila River and the small dry washes even though construction and upgrade of the line would cross the Gila River and the small dry washes. **All American Pipeline** The conversion of the pipeline would not contribute to water usage in the area. Disturbances to surface water are expected to be minimal. **Housing Subdivisions** The water use associated with the future development cannot be predicted. The likely source of the water would be groundwater.
BIOLOGICAL RESOURCES	Minimal impacts to native wash community from the proposed Facility construction and operation are anticipated. Potential loss and/or disturbance of 50 acres of sparse native vegetation during construction. Potential loss of 50 acres of non-game wildlife habitats.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would involve minor temporary disturbances during construction activities.

Table 4-19
Cumulative Impacts (continued)

Affected Environment	Proposed Action	Other Projects in Area
BIOLOGICAL RESOURCES (continued)	Potential impacts from pipeline and transmission line construction to vegetation related to the loss and/or disturbance to native plant communities. No significant adverse impacts to special status species from the proposed Facility, pipeline, and transmission line construction and operation are anticipated to species in Pinal County. Minimal impact expected due to loss of habitat.	**All American Pipeline** The conversion of the pipeline would involve minor temporary disturbances during construction activities. **Housing Subdivisions** The development of housing subdivisions could disturb a large amount of land depending on the size of the development. The land parcels are currently used for agriculture, and therefore the impacts are not expected to be significant.
CULTURAL RESOURCES	No significant impacts on cultural resources are expected from the proposed Facility construction and operation. No significant historic properties were found in the proposed Facility site during previous cultural surveys. Prehistoric artifact scatter was recorded outside the potential affected area. Past investigations indicate a low potential for significant historic or prehistoric sites. Previous inventories would be reviewed before construction begins. Potential disturbances not covered by previous investigations would be inventoried before construction.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line probably would have an impact on cultural resources. **All American Pipeline** The conversion of the pipeline would have no impacts to cultural resources. **Housing Subdivisions** The development of housing subdivisions could disturb a large amount of land depending on the size of the development. No surveys of the parcels have been undertaken, so the potential for disturbance cultural resources is unknown.
VISUAL RESOURCES	Impacts to visual landscape from the addition of buildings, exhaust stacks, and night lighting when viewed from sensitive viewpoints, travel routes, recreation areas, and residences. Short-term impacts due to construction and operation of gas pipeline due to vegetation removal in the ROW, until vegetation has been reestablished in disturbed areas. No impacts to croplands after the ROW has been replanted with crops.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would have no new visual impacts. **All American Pipeline** The conversion of the pipeline would have no new visual impacts. **Housing Subdivisions** Development of some of the nearby parcels of agricultural land into housing subdivisions would have several cumulative effects on visual resources. The proposed

Table 4-19
Cumulative Impacts (continued)

Affected Environment	Proposed Action	Other Projects in Area
VISUAL RESOURCES (continued)	Short-term impacts during construction while using local roads. Significant long-term impacts to the landscape from the installation of pole structures when viewed from sensitive viewpoints and in scenic landscapes, and a small number of residents and travelers on nearby county roads.	development would transform the area from an agricultural vista to a broken agricultural/residential housing view. While, there would be more people nearby to view the stacks and power poles, only those on the nearby edges of the development would be affected. Other residents would see neighboring houses in the foreground.
TRANSPORTATION	Minimal impacts to transportation are expected from the proposed Facility construction and operation. Access road would be entirely within the Site. Short-term traffic impacts are expected at the junction of Randolph Road and the access road by construction activities and construction traffic. Short-term traffic delays may occur in Coolidge due the large vehicles delivering equipment and construction activities. Short-term pipeline construction-related traffic impacts at highway crossings. Access to existing ROW expected to cause temporary traffic impacts from construction-related traffic stops and lane closures.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would involve short-term traffic delays related to large vehicles delivering equipment and construction activities at highway crossings and intersections of local roads with access roads. **All American Pipeline** The conversion of the pipeline would involve short-term traffic delays related to large vehicles delivering equipment and construction activities at highway crossings and intersections of local roads with access roads. **Housing Subdivisions** The development of residential subdivisions could result in more traffic on more numerous and wider paved roads in the vicinity.
SOCIOECONOMICS	Positive impacts on the local economy are expected from the proposed Facility construction and operation. Increased tax revenues are anticipated. Local economy would be affected by direct project spending and induced economic effects. Minimal impacts to public utilities, services, and schools in Coolidge and Phoenix are anticipated. Positive impact anticipated for electricity supply and reliability of regional system.	**Coolidge-Rogers** The potential upgrade and reconductoring of the transmission line would have no impacts. **All American Pipeline** The conversion of the pipeline would result in increased availability of natural gas in the area and could increase the potential for development. **Housing Subdivisions** The residential development could increase burdens on schools and other community services. However, the increase to the.

SOCIOECONOMICS (continued)		property tax base should offset these burdens.
ENVIRONMENTAL JUSTICE	No impacts from construction and operation of the proposed Facility are anticipated. No impacts from construction and operation of pipelines are anticipated. No impacts from construction and operation of transmission lines are anticipated.	**Coolidge -Rogers** The potential upgrade and reconductoring of the transmission line would have no environmental justice impacts. **All American Pipeline** The pipeline conversion would have no environmental justice impacts. **Housing Subdivisions** The residential development would have no environmental justice impacts.

5.1 LAWS, REGULATIONS, EXECUTIVE ORDERS, AND DOE ORDERS

The major Federal law, regulations, Executive Orders, and other compliance actions that potentially apply to the proposed Project, depending on the various alternatives, are identified in Table 5-1. There are a number of Federal environmental statutes that address environmental protection, compliance or consultation. In addition, certain environmental requirements have been delegated to State authorities for enforcement and implementation. It is Western's policy to conduct its operations in an environmentally safe manner and in compliance with all applicable statutes, regulations, and standards. Although this chapter does on address pending legislation or future regulations, Western recognizes that the regulatory environment is in transition, and subject to many changes, and that the construction and operation of the proposed Project must be conducted in compliance with all applicable regulations and standards.

5.2 REGULATORY ACTIVITIES

New permits and approvals would be needed before the proposed Project and associated facilities could be constructed. Permits regulate many aspects of facility construction and operations, including the quality of construction, treatment and storage of hazardous waste, and discharges of effluents to the environment. These permits would be obtained as required from appropriate Federal, state, and local agencies. Table 5-2 contains a summary of the primary approvals that would be required to implement the Proposed Action or the alternatives.

5.3 CONSULTATIONS

Certain statutes and regulations require Western to consider consultations with Federal, state, local agencies, and federally recognized Native American groups regarding the potential for the proposed Project to disturb sensitive resources. The needed consultations must occur in a timely manner and are generally required before any land disturbance can begin. Most of these consultations are related to biological, cultural, and Native American resources. Biological resource consultations generally pertain to the potential for activities to disturb sensitive species or habitats. Cultural resource consultations pertain to the potential for destruction of important cultural or archeological sites. Native American consultations are concerned with the potential for disturbance of Native American ancestral sites or traditional practices.

Western has initiated informal consultation with the USFWS regarding Western's need to address effects to proposed, candidate, and listed threatened and/or endangered species (see Letters, Appendix A). Western's determination on whether the proposed Project would adversely affect proposed, candidate or listed species is pending on the completion of the biological assessment.

A Class I cultural resource review of the proposed Project has been completed. Consultations with the State Historic Preservation Officer and affected Tribes would be initiated upon completion of intensive and ethnographic surveys.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Air Resources	Clean Air Act (CAA) As amended	42 USC §§ 7401 et seq.	Environmental Protection Agency (EPA)	Requires sources to meet standards and obtain permits to satisfy: National Ambient Air Quality Standards, State Implementation Plans, Standards of Performance for New Stationary Sources, National Emission Standards for Hazardous Air Pollutants, and Prevention of Significant Deterioration.
	National Ambient Air Quality Standards (NAAQS)/State Implementation Plans	42 USC §§ 7409 et seq.	EPA	Requires compliance with primary and secondary ambient air quality standards governing sulfur dioxide, nitrogen oxide, carbon monoxide, ozone, lead, and particulate matter and emission limits/reduction measures as designated in each state's implementation plan.
	Standards of Performance for New Stationary Sources	42 USC §§ 7411 et seq.	EPA	Establishes control/emission standards and recordkeeping requirements for new or modified sources specifically addressed by a standard.
	National Emission Standards for Hazardous Air Pollutants	42 USC §§ 7412 et seq.	EPA	Requires sources to comply with emission levels of carcinogenic or mutagenic pollutants; may require a preconstruction approval, depending on the process being considered and the level of emissions that will result from the new or modified source.
	Prevention of Significant Deterioration	42 USC §§ 7470 et seq.	EPA	Applies to areas that are in compliance with NAAQS. Requires comprehensive preconstruction review and the application of Best Available Control Technology to major stationary sources (emissions of 100 t/year) and major modifications; requires a preconstruction review of air quality impacts and the issuance of a construction permit from the responsible state agency setting forth emission limitations to protect the Prevention of Significant Deterioration increment.
	Noise Control Act of 1972	42 USC §§ 4901 et seq.	EPA	Requires facilities to maintain noise levels that do not jeopardize the health and safety of the public.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Water Resources	Clean Water Act (CWA)	33 USC §§ 1251 et seq.	EPA	Requires EPA or state-issued permits and compliance with provisions of permits regarding discharge of effluents to surface waters.
	National Pollutant Discharge Elimination System (NPDES) (section 402 of CWA)	33 USC §§ 1342 et seq.	EPA	Requires permit to discharge effluents (pollutants) and stormwaters to surface waters; permit modifications are required if discharge effluents are altered.
	Safe Drinking Water Act (SDWA)	42 USC §§ 300f et seq.	EPA	Requires permits for construction/operation of underground injection wells and subsequent discharging of effluents to ground aquifers.
	Executive Order 11988: Floodplain Management	3 CFR, 1977 Comp., p. 117	Water Resources Council, Federal Emergency Management Agency, Council on Environmental Quality (CEQ)	Requires consultation if project impacts a floodplain.
Hazardous wastes and soil resources	Compliance with Floodplain/ Wetland Environmental Review Requirements	10 CFR 1022	Department of Energy (DOE)	Requires DOE to comply with all applicable floodplain/wetlands environmental review requirements.
	Farmland Protection Policy Act of 1981	7 USC §§ 4201 et seq.	Soil Conservation Service	DOE shall avoid any adverse effects to prime and unique farmlands.
Biological Resources	Bald and Golden Eagle Protection Act	16 USC §§ 668 et seq.	U.S. Fish and Wildlife Service (USFWS)	Consultations should be conducted to determine if any protected birds are found to inhabit the area. If so, DOE must obtain a permit prior to moving any nests due to construction or operation of project facilities.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
Biological Resources (continued)	Migratory Bird Treaty Act	16 USC §§ 703 et seq.	USFWS	Requires consultation to determine if there are any impacts on migrating bird populations due to construction or operation of project facilities. If so, DOE will develop mitigation measures to avoid adverse effects.
	Endangered Species Act of 1973	16 USC §§ 1531 et seq.	USFWS/ National Marine Fisheries Service	Requires consultation to identify endangered or threatened species and their habitats, assess DOE impacts thereon, obtain necessary biological opinions, and, if necessary, develop mitigation measures to reduce or eliminate adverse effects of construction or operations.
Cultural Resources	National Historic Preservation Act of 1966, as amended	16 USC §§ 470 et seq.	President's Advisory Council on Historic Preservation	Require DOE to consult with the State Historic Preservation Office (SHPO) prior to construction to ensure that no historical properties will be affected.
	Archaeological and Historical Preservation Act of 1974	16 USC §§ 469 et seq.	Department of the Interior	Requires DOE to obtain authorization for any disturbances of archaeological resources.
	Antiquities Act	16 USC §§ 431-433	Department of the Interior	Requires DOE to comply with all applicable sections of the Act.
	American Indian Religious Freedom Act of 1978	42 USC §§ 1996	Department of the Interior	Requires DOE to consult with local Native American Indian tribes prior to construction to ensure that their religious customs, traditions, and freedoms are preserved.
	Executive Order 11593: Protection and Enhancement of the Cultural Environment	3 CFR 154, 1971-1975 Comp., p. 559	Department of the Interior	Requires DOE to aid in the preservation of historic and archeological data that may be lost during construction activities.
	Executive Order 13007: Protection and Accommodatior of Access to "Indian Sacred Sites"	May 24, 1996	Department of the Interior	Requires DOE to consider the potential impact of its actions on Native American sacred sites, access to sacred sites, or use of sacred sites.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
	Executive Order 13084: Consultation and Coordination With Indian Tribal Governments	May 14, 1998	Department of the Interior	Requires DOE to consult on a government-to-government basis with tribes and Nations
Worker Safety and Health	Occupational Safety and Health Act	5 USC §§ 5108	OSHA	Requires Agencies to comply with all applicable work safety and health legislation (including guidelines of 29 CFR 1960) and prepare, or have available, Material Safety Data Sheets.
Worker Safety and Health (continued)	Hazard Communication Standard	29 CFR 1910.1200	OSHA	Requires DOE to ensure that workers are informed of, and trained to handle all chemical hazards in the DOE workplace.
Other	National Environmental Policy Act	42 USC §§ 4321 et seq.	Council on Environmental Quality (CEQ)	Requires DOE to comply with NEPA implementing procedures in accordance with 10 CFR 1021.
	Toxic Substances Control Act (TSCA)	42 USC §§ 2011	EPA	Requires DOE to comply with inventory reporting requirements and chemical control provisions of TSCA to protect the public from the risks of exposure to chemicals. TSCA imposes strict limitations on use and disposal of polychlorinated biphenyl-contaminated equipment.
	Hazardous Materials Transportation Act	49 USC §§ 1801 et seq.	Department of Transportation (DOT)	Requires DOE to comply with the requirements governing hazardous materials and waste transportation.
	Emergency Planning and Community Right-To-Know Act of 1986	42 USC §§ 11001 et seq.	EPA	Requires the development of emergency response plans and reporting requirements for chemical spills and other emergency releases, and imposes right-to-know reporting requirements covering storage and use of chemicals which are reported in toxic chemical release forms.
	Pollution Prevention Act of 1990	42 USC §§ 11001-11050	EPA	Establishes a national policy that pollution should be reduced at the source and requires a toxic chemical source reduction and

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
				recycling report for an owner or operator of facility required to file an annual toxic chemical release form under section 313 of SARA.
	Objects Affecting the Navigation Space	14 CFR 77	Federal Aviation Administration (FAA)	Provisions of these regulations specify the criteria used by the FAA for determining whether a "Notice of Proposed Construction or Alteration" is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved.
	Proposed Construction and/ or Alteration of Objects that May Affect the Navigation Space	FAA Advisory Circular (AC) No. 70/460-2H	FAA	This circular informs each proponent of a project that could pose an aviation hazard of the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA.
	Obstruction Marking and Lighting	FAA AC No. 70/460-1G	FAA	This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
	Radio Frequency Device, Kits	47 CFR 15.25	Federal Communications Commission (FCC)	Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement.
	Executive Order 12843: Procurement Requirements and Policies for Federal Agencies for Ozone Depleting Substances	April 12, 1993	EPA	Requires Federal agencies to minimize procurement of ozone depleting substances and conform their practices to comply with Title VI of CAA Amendments referencing stratospheric ozone protection and to recognize the increasingly limited availability of Class I substances until final phaseout.

Table 5-1
Federal Environmental Statutes, Regulations and Orders

Resource Category	Statute/ Regulation/Order	Citation	Responsible Agency	Permits, Approvals, Consultations, and Notifications
	Executive Order12856: Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements	August 3, 1993	EPA	Requires Federal agencies to achieve 50-percent reduction of agency's total releases of toxic chemicals to the environment and offsite transfers, to prepare a written facility pollution prevention plan not later than 1995, to publicly report toxic chemicals entering any waste stream from Federal facilities, including any releases to the environment, and to improve local emergency planning, response, and accident notification.
	Executive Order 12873: Federal Acquisition, Recycling, and Waste Prevention	October 20, 1993	EPA	Requires Federal agencies to develop affirmative procurement policies and establishes a shared responsibility between the system program manager and the recycling community to effect use of recycled items for procurement.
	Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	February 11, 1994	EPA	Requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.
	Executive Order 12088: Federal Compliance with Pollution Control Standards	3 CFR, 1978 Comp., p. 243	Office of Management and Budget (OMB)	Requires Federal agency landlords to submit to OMB an annual plan for control of environmental pollution and to consult with EPA and state agencies regarding the best techniques and methods.
	Executive Order 11514: Protection and Enhancement of Environmental Quality	3 CFR, 1966-1970 Comp., p.902	CEQ	Requires Federal agencies to demonstrate leadership in achieving the environmental quality goals of NEPA; provides for DOE consultation with appropriate Federal, state, and local agencies in carrying out their activities as they affect the environment.`

Western has initiated consultations with Federal and State agencies as well as federally recognized Native American groups regarding the potential alternatives for the Sundance Energy proposed Project to disturb sensitive resources. Table 5-3 presents a summary of the consultations initiated by DOE. Appendix A contains copies of the various consultation letters sent by Western to Agencies and Native American groups and the written responses provided by those agencies and groups. All agencies and Native American groups will be provided with a copy of the Draft Sundance Energy EIS. Information from the agencies and Native American groups responses has been incorporated into Chapters 3 and 4 as appropriate.

Table 5-2
Project List of Permits/Approvals

Agency	Permit/Approval
Arizona Corporation Commission (ACC)	Certificate of Environmental Compatibility
Pinal County Air Quality Control District	Air Quality Permits
U.S. Environmental Protection Agency (EPA)	– Prevention of Significant Deterioration (PSD) Permit – Operating Permit – Acid Rain Permit
	Toxic Air Emissions
Arizona Department of Environmental Quality (ADEQ)	Aquifer Protection Permit
ADEQ	Hazardous Waste Permit
ADEQ/EPA	Stormwater Permits
Arizona Department of State Lands	Condemnation by Western
Bureau of Land Management (BLM)	Right-of-way Grant
Arizona Department of Agriculture	Native Plant Permit
Arizona Department of Transportation (ADOT)	Encroachment Permit Crossing Permit Boring Permit Class C Permit
Pinal County	Zoning Approval Industrial Use Permit Excavation/Grading Permit Septic Permit Permit for Temporary Construction Facilities Permit for Temporary Power Building Permits Permit to Build in Roadway
US Fish and Wildlife Service	Concurrence or Biological Opinion
Arizona State Historic Preservation Office	Concurrence or Agreement Document
U.S. Army Corps of Engineers	Nationwide 404 Permit
Arizona State Museum	Cultural Resources Inventory Permit Burial Agreement

Table 5-3
Summary of Consultations Initiated by Western

Subject	DOE Consultation Letter	Agency/Group Response
	Addressed To (Date of Letter)	**From (Date of Response or Last Contact)**
Land Management	Mr. Mike Anable Arizona State Land Department (December 29, 2000)	
Land Management	Jim Anderson Bureau of Land Management (December 29, 2000)	Michael A. Taylor Bureau of Land Management (January 8, 2001)
Native American	Donald Antone Gila River Indian Community (December 20, 2000)	Barnaby Lewis – verbal contact (January 9, 2001)
Biological Resources	Robert Broshid Arizona Game and Fish Department (December 29, 2000)	
Native American	Delia Carlyle Ak-Cin Community (December 20, 2000)	Mr. Jon Shumaker – verbal contact (January 16, 2001)
NEPA	David Farrell Environmental Protectional Agency, Region 9 (December 29, 2000)	
Air Quality	Donald Gabrielson Pinal Air Quality Stationary Sources (December 20, 2000)	
Cultural Resources	James Garrison Arizona State Historic Preservation Officer (December 20, 2000)	
Biological Resources	David L. Harlow U.S Fish and Wildlife Service (October 12, 2000 and November 29, 2000)	David L. Harlow (November 15, 2000 and December 14, 2000)
Biological Resources	Kim Hartwig U.S Fish and Wildlife Service (December 29, 2000)	
State Official	Jane Dee Hull Governor of Arizona (December 20, 2000)	
Native American	Ivan Makil Salt River Pima-Maricopa Indian Community (December 20, 2000)	Mr. Ron Chiago – verbal contact (January 9, 2001)

Table 5-3
Summary of Consultations Initiated by Western

Subject	DOE Consultation Letter	Agency/Group Response
	Addressed To (Date of Letter)	**From (Date of Response or Last Contact)**
Native American	Edward Manuel Tohono O'odham Nation (December 21, 2000)	
Biological Resources	James McGinnis Arizona Department of Agriculture Native Plant & Cultural Resource Protection (October 13, 2000 and November 28, 2000)	James McGinnis (October 20, 2000)
Land Manage-ment	Davis F. Pecusa Bureau of Indian Affairs, Pima Agency (December 29, 2000)	
Biological Resources	Duane Shroufe Arizona Game and Fish Department (October 13, 2000 and November 20, 2000)	State of Arizona Game and Fish Department, Project Evaluation Program, Habitat Branch Heritage Data, (November 12, 2000 and December 20, 2000))
Cultural Resources	Don Spencer Casa Grande National Monument National Park Service (December 29, 2000)	
Native American	Raymond Stanley San Carlos Apache Tribe (December 20, 2000)	Vernelda Grant – verbal contact (January 9, 2001)
Native American	Peter Steere Tohono O'odham Nation (January 30, 2001)	Peter Steere – verbal contact (January 10, 2001)
Native American	Wayne Taylor, Jr. The Hopi Tribe (December 20, 2000)	Leigh Kuwanwisiwma – letter (October 23, 2000) verbal contact (January 18, 2001)
Air Quality	Richard Tobin Arizona Department of Environmental Quality (December 20, 2000)	
Native American	Robert Valencia Pascua Yaqui Tribe of Arizona (January 30, 2001)	Amalia Reyes – verbal contact (January 16, 2001)
Water Resources	Greg Wallace Arizona State Department of Water Resources (December 29, 2000)	

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LIST OF ACRONYMS AND ABBREVIATIONS

AAAQG	Arizona Ambient Air Quality Guidelines
AADT	Annual Average Daily Traffic
ACC	Arizona Corporation Commission
ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
ADHS	Arizona Department of Health Standards
AM	Amplitude Modulation
AMA	Pinal Active Management Area
APP	Aquifer Protection Permit
APS	Arizona Public Service
AQCR	Air Quality Control Region
AQRV	Air Quality Related Values
AZMET	Arizona Meteorological Network
BACT	Best Available Control Technology
BADCT	Best Available Demonstrated Control Technology
BLM	Bureau of Land Management
bsg	below surface grade
CAP	Central Arizona Project
CAS	Chemical Abstract Service
CATEF	California Air Toxics Emission Factors
CAWCD	Central Arizona Water Conservation District
CEQ	Council on Environmental Quality
CO	carbon monoxide
DEIS	Draft Environmental Impact Statement
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation

DSW	Western's Desert Southwest Customer Service Regional Office
ELF-EMF	extremely-low-frequency electric and magnetic field
EIS	Environmental Impact Statement
El Paso	El Paso Natural Gas Company
EMS	Emergency Medical System
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPRI	Electric Power Research Institute
Facility	Generating facility
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FLAG	Federal Land Managers' Air Quality Related Values Workgroup
FM	Frequency modulation
GE	General Electric
GMA	Groundwater Management Act
GR	General Rural
HAP	Hazardous Air Pollutant
HID	Hohokam Irrigation District
IGR	Irrigation Grandfathered Rights
ISCST	Industrial Source Complex Short Term
KOP	Key Observation Point
LCU	lower conglomerate unit
M&I	Municipal and Industrial
MSA	Metropolitan Statistical Area
MSCU	middle silt and clay unit
MSID	Maricopa-Stanfield Irrigation District
MSL	mean sea level
NEIC	National Earthquake Information Center
NEPA	National Environmental Policy Act
NIEHS	National Institute of Environmental Health Sciences
NIOSH	National Institute of Occupational Safety and Health

NRCS	Natural Resource Conservation Service
NWS	National Weather Service
ORV	off-road vehicle
OSC	Oil Spill Contingency
OSHA	Occupational Safety and Health Administration
PAD	Planned Area Development
PCAQCD	Pinal County Air Quality Control District
POC	point(s) of compliance
Project	Sundance Energy Project
PSD	Prevention of Significant Deterioration
RAPID	Research and Public Information Dissemination
RO	Reverse Osmosis
ROI	Region of Influence
ROW	rights-of-way
SCIDD	San Carlos Irrigation and Drainage District
SCR	Selective Catalytic Reduction
SCS	Soil Conservation Service
SIC	Standard Industrial Code
SPCC	Spill Prevention Countermeasure and Control
Tariff	Notice of Final Open Access Transmission Service Tariff
TDS	total dissolved solids
UAU	upper alluvial unit
UR	Urban Ranch Residential
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compounds
Western	Western Area Power Administration
WS	Waters of the State
WUS	Waters of the United States

CHEMICALS AND ABBREVIATIONS

ac-ft	acre foot or acre feet
bcf	billion cubic feet
cf/hr	cubic feet per hour
CO	carbon monoxide
dB	decibel
dBA	weighted sound levels
F	Fahrenheit
gm	gram
gpm	gallons per minute
K	Kelvin
km	kilometer
kV	kilovolt
lbs	pounds
$\mu g/m^3$	microgram per cubic meter
m	meter
mg/L	milligram per liter
MMBtu	million British Thermal Unit
MMscf	million standard cubic feet
mmcf	million cubic feet
MW	megawatt
NO_2	nitrogen dioxide
NO_x	nitrous oxides

O_3	ozone
PM_{10}	particulate matter less than 10 microns in diameter
Pb	lead
ppb	parts per billion
ppm	parts per million
ppmvd	parts per million dry volume
psig	pounds per square inch
SO_2	sulfur dioxide
VOC	volatile organic compounds
yr	year
*m*T	microtesla

CONVERSION CHART

To Convert Into Metric			To Convert Into English		
If You Know	**Multiply By**	**To Get**	**If You Know**	**Multiply By**	**To Get**
Length					
inch	2.54	centimeter	centimeter	0.3937	inch
feet	30.48	centimeter	centimeter	0.0328	feet
feet	0.3048	meter	meter	3.281	feet
yard	0.9144	meter	meter	1.0936	yard
mile	1.60934	kilometer	kilometer	0.62414	mile (Statute)
Area					
square inches	6.4516	square centimeter	square centimeter	0.155	square inch
square feet	0.092903	square meter	square meter	10.7639	square feet
square yard	0.8361	square meter	square meter	1.196	square yard
acre	0.40469	hectare	hectare	2.471	acre
square mile	2.58999	square kilometer	square kilometer	0.3861	square mile
acre-foot	1233.48	cubic meters	cubic meters	0.00081	acre-foot
Volume					
fluid ounce	29.574	milliliter	milliliter	0.0338	fluid ounce
gallon	3.7854	liter	liter	0.26417	gallon
gallon	0.0039	cubic meter	cubic meter	256.14	gallon
cubic feet	0.028317	cubic meter	cubic meter	35.315	cubic feet
cubic yard	0.76455	cubic meter	cubic meter	1.308	cubic yard
Weight					
ounce	28.3495	gram	gram	0.03527	ounce
pound	0.45360	kilogram	kilogram	2.2046	pound
short ton	0.90718	metric ton	metric ton	1.1023	short ton
Force					
dyne	0.00001	newton	newton	100,000	dyne
Temperature					
Fahrenheit	Subtract 32 then multiply by 5/9ths	Celsius	Celsius	Multiply by 9/5ths, then add 32	Fahrenheit

METRIC PREFIXES

Prefix	Symbol	Multiplication Factor
exa-	E	1 000 000 000 000 000 000 = 10^{18}
peta-	P	1 000 000 000 000 000 = 10^{15}
tera-	T	1 000 000 000 000 = 10^{12}
giga-	G	1 000 000 000 = 10^{9}
mega-	M	1 000 000 = 10^{6}
kilo-	k	1 000 = 10^{3}
hecto-	h	l00 = 10^{2}
deka-	da	l0 = 10^{1}
deci-	d	0.1 = 10^{-1}
centi-	c	0.01 = 10^{-2}
milli-	m	0.001 = 10^{-3}
micro-	*m*	0.000 001 = 10^{-6}
nano-	n	0.000 000 001 = 10^{-9}
pico-	p	0.000 000 000 001 = 10^{-12}
femto-	f	0.000 000 000 000 001 = 10^{-15}
atto-	a	0.000 000 000 000 000 001 = 10^{-18}

Acre-foot: The volume of water that will cover an area of 1 acre to a depth of 1 foot (326,000 gallons, 0.5 second foot days, 1,233.5 cubic meters).

Active storage: Storage in a reservoir that is normally used for water development and flood control. Storage above the minimum power pool and below the top of the flood control storage.

Advisory Council on Historic Preservation: A 19-member body appointed to advise the President and Congress in the coordination of actions by Federal agencies on matters relating to historic preservation.

Adjustment provisions: Sales contract provisions for changes in hydrologic resources.

Administrator: The Administrator of the Western Area Power Administration.

Aeolian: Borne, deposited, produced, or eroded by the wind.

Aesthetics: Referring to the perception of beauty.

Affected environment: Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.

Air dispersion modeling: a mathematical simulation, usually computer-generated, of how gases, vapors, or particles disperse into the air.

Air fogging system: During hot weather conditions, the air fogging system cools incoming air to combustion turbines by spraying a fine mist – or a fog – of water in front of the air intakes which in turn increases turbine generating capacity.

Air pollutant: Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare.

Air quality: Generally, an airborne substance that could, in high enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare.

Air Quality Control Region (AQCR): Geographic subdivisions of the United States established to regulate pollution on a region or local level. Some regions span more than one state.

Air Quality Standards: The level of pollutants prescribed by regulation that may not be exceeded during a specified time in a defined area.

Alluvial deposits: Deposits of earth, sand, gravel, and other materials carried by moving surface water deposited at points of weak water flow.

Ambient air: Any unconfined portion of the atmosphere; open air, surrounding air. That portion of the atmosphere, external to buildings, to which the general public has access.

Amperes: Measure of the flow of electric current; source of a magnetic field.

Aquifer: A body of rock or sediment in a formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Archaeological sites (resources): Any location where humans have altered the terrain or discarded artifacts during either prehistoric or historic times.

Archaeology: A scientific approach to the study of human ecology, cultural history, and cultural process.

Artifact: An object produced or shaped by human workmanship of archaeological or historical interest.

Attainment area: An area which the U.S. Environmental Protection Agency (EPA) has designated as being in compliance with one or more of the National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. Any area may be in attainment for some pollutants but not for others.

Atmospheric dispersion: The process of air pollutants being dispersed into the atmosphere. This occurs by the wind that carries the pollutants away from their source and by turbulent air motion that results from solar heating of the Earth's surface and air movement over rough terrain and surfaces.

Auxiliary transformer: A backup transformer.

Background noise: The total acoustical and electrical noise from all sources in a measurement system that may interfere with the production, transmission, time averaging, measurement, or recording of an acoustical signal.

Baseload: Within the alternatives, this refers to operating the hydropower system to maximize baseload energy production. Baseload power plants have high capacity factors meaning they operate much of the time.

Bounding: A credible upper limit to consequences or impacts.

Blading: The use of a steel blade or steel fork attachment on a tracked or rubber-tired vehicle that removes vegetation through a combination of pushing and/uplifting motions.

Breaker: A switching device that is capable of closing or interrupting an electrical circuit under over-load or short- circuit conditions as well as under normal load conditions.

Bus: A set of two or more electrical conductors that serve as common connections between load circuits and each of the phases (in alternating current systems) of the source of electric power.

Candidate species: A species of plant or animal for which there is sufficient information to indicate biological vulnerability and threat, and for which proposing to list as "threatened" or "endangered" is or may be appropriate.

Capability: The maximum load that a generator, turbine, transmission circuit, apparatus, station, or system can supply under specified conditions for a given time interval, without exceeding approved limits of temperature and stress.

Capacity: The load for which a generator, turbine, transformer, transmission circuit, apparatus, station, or system is rated. Capacity is also used synonymously with capability.

Carbon monoxide (CO): A colorless, odorless gas that is toxic if breathed in high concentrations over a period of time. It is formed as the product of the incomplete combustion of hydrocarbons (fuel).

Class I, II, and III Areas: Area classifications, defined by the *Clean Air Act*, for which there are established limits to the annual amount of air pollution increase. Class I areas include international parks and certain national parks and wilderness areas; allowable increases in air pollution are very limited. Air pollution increases in Class II areas are less limited, and are least limited in Class III areas. Areas not designated as Class I start out as Class II and may be reclassified up or down by the state, subject to federal requirements.

Clean Air Act (CAA): (42 U.S. Code 7401 et seq.) Establishes (1) national air quality criteria and control techniques (Section 7408); (2) National ambient air quality standards (Section 7409); (3) state implementation plan requirements (Section 4710); (4) federal performance standards for stationary sources (Section 4711); (5) national emission standards for hazardous air pollutants (Section 7412); (6) applicability of CAA to federal facilities (Section 7418), i.e., Federal agency must comply with federal, state, and local requirements respecting control and abatement of air pollution, including permit and other procedural requirements, to the same extent as any person; (7) federal new motor vehicle emission standards (Section 7521); (8) regulations for fuel (Section 7545); (9) aircraft emission standards (Section 7571).

Clean Water Act: (33 U.S. Code 1251 et seq.) Restores and maintains the chemical, physical, and biological integrity of the nation's waters.

Climatology: The science that deals with climates and investigates their phenomena and causes.

Code of Federal Regulations (CFR): All Federal regulations in force are published in codified form in the Code of Federal Regulations.

Combined-Cycle Generation Facility The combination of a gas turbine and a steam turbine in an electric generation plant. The waste heat from the gas turbine provides the heat energy for the steam turbine.

Combustion turbine: Turbine operating on fuels that are capable of converting heat energy into electrical energy.

Community (biotic): All plants and animals occupying a specific area under relatively similar conditions.

Compressor: A machine, especially a pump, for compressing air, gas, etc.

Conservation: A reduction in electric power consumption as a result of increases in the efficiency of energy use, production, or distribution.

Consumptive water use: The difference in the volume of water withdrawn from a body of water and the amount released back into the body of water.

Corona effect: Electrical breakdown of air into charged particles. It is caused by the electric field at the surface of conductors.

Council on Environmental Quality (CEQ): Established by the *National Environmental Policy Act* (NEPA), the CEQ consists of three members appointed by the President. A CEQ regulation (Title 40 Code of Federal Regulations [CFR] 1500-1508, as of July 1, 1986) describes the process for implementing NEPA, including preparation of environmental assessments and environmental impacts statements, and the timing and extent of public participation.

Criteria pollutants: An air pollutant that is regulated by the National Ambient Air Quality Standards (NAAQS). The U.S. Environmental Protection Agency (EPA) must describe the characteristics and potential health and welfare effects that form the basis for setting or revising the standard for each regulated pollutant. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter.

Critical habitat: Defined in the Endangered Species Act of 1973 as "specific areas within the geographical area occupied by [an endangered or threatened] species..., essential to the conservation of the species and which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species... that are essential for the conservation of the species."

Cultural resources: Districts, sites, structures, and objects and evidence of some importance to a culture, a subculture, or a community for scientific, traditional, religious, and other reasons. These resources and relevant environmental data are important for describing and reconstructing past lifeways, for interpreting human behavior, and for predicting future courses of cultural development.

Cumulative impact: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Customer: Any entity or entities purchasing power from the power generator or distributor provider.

Decibel (dB): A unit for expressing the relative intensity of sounds on a logarithmic scale from zero for the average least perceptible sound to about 130 for the average level at which sound causes pain to humans. For traffic and industrial noise measurements, the A-weighted decibel (dBA), a frequency-weighted noise unit, is widely used. The A-weighted decibel scale corresponds approximately to the frequency response of the human ear and thus correlates well with loudness.

Demand: The rate at which energy is used at a given instant or averaged over a designated period of time.

Demineralization: To remove minerals, as salt, from water.

Deposition: In geology, the laying down of potential rock-forming materials; sedimentation. In atmospheric transport, the settling out on ground and building surfaces of atmospheric aerosols and particles ("dry deposition") or their removal from the air to the ground by precipitation ("wet deposition" or "rainout").

Discharge: The volume of water released from a dam or powerhouse at a given time, usually expressed as cubic feet per second.

Distance zones: The relative visibility from travel routes or observation points.

Double-circuit: Two sets of lines (circuits) on a single tower (a single circuit consists of three conductors).

Drainage basin: An aboveground area that supplies the water to a particular stream.

Drawdown: The height difference between the natural water level in a formation and the reduced water level in the formation caused by the withdrawal of groundwater.

Drinking water standards: The prescribed level of constituents or characteristics in a drinking water supply that cannot be exceeded legally.

Ecology: A branch of science dealing with the interrelationships of living organisms with one another and with their nonliving environment.

Ecosystem: Living organisms and their nonliving (abiotic) environment functioning together as a community.

Effects: As used in NEPA documentation, the terms effects and impacts are synonymous. Effects can be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

Effluent: A waste stream flowing into the atmosphere, surface water, ground water, or soil. Most frequently the term applies to wastes discharged to surface waters.

Elevation: Height in feet above sea level.

Eligibility: The criteria of significance in American history, architecture, archeology, engineering, and culture. The criteria require integrity and association with lives or events, distinctiveness for any of a variety of reasons, or importance because of information the property does or could hold.

Eligible cultural resource: A cultural resource that has been evaluated and reviewed by an agency and the State Historic Preservation Office(r) and recommended as eligible for inclusion in the National Register of Historic Places, based on the criteria of significance.

Emissions: Pollution discharged into the atmosphere from smoke stacks, other vents, and surface areas of commercial or industrial facilities, residential chimneys, and vehicle exhausts.

Emission Standards: Requirements established by a state, local government, or the U.S. Environmental Protection Agency (EPA) Administrator that limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.

Endangered Species: Plants or animals that are in danger of extinction through all or a significant portion of their ranges and that have been listed as endangered by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act and its implementing regulations (50 CFR 424). *Note: Some states also list species as endangered. Thus, in certain cases a state definition would also be appropriate*.

Endangered Species Act: (16 U.S. Code 1531 et seq.) Provides for listing and protection of animal and plant species identified as in danger, or likely to be in danger, or extinction throughout all or a significant portion of their range. Section 7 places strict requirements on federal agencies to protect listed species.

Environmental Impact Statement: The detailed written statement that is required by section 102(2)(C) of the National Environmental Policy Act (NEPA) for a proposed major Federal action significantly affecting the quality of the human environment. A DOE EIS is prepared in accordance with applicable requirements of the Council on Environmental Quality NEPA regulations in 40 CFR Parts 1500-1508, and the Department of Energy NEPA regulations in 10 CFR Part 1021.

Environmental Justice: An identification of potential disproportionately high and adverse impacts on low-income and/or minority populations that may result from proposed federal actions (required by Executive Order 12898).

Energy: That which does or is capable of doing work. It is measured in terms of the work it is capable of doing; electric energy is usually measured in kilowatt-hours.

Ephemeral stream: A stream that flows only after a period of heavy precipitation.

Erosion: Wearing away of soil and rock by weathering and the actions of surface water, wind, and underground water.

Ethnographic: Information about cultural beliefs and practices.

Executive Order 12898: Issued by the President on February 11, 1994, this Executive Order requires federal agencies to develop implementation strategies, identify low-income and minority populations that may be disproportionately impacted by proposed federal actions, and solicit the participation of low-income and minority populations.

Facility: The power generating components of the natural gas-fired, simple cycle peaking power plant.

Fault: A fracture or a zone of fractures within a rock formation along which vertical, horizontal, or transverse slippage has occurred. A normal fault occurs when the hanging wall has been depressed in relation to the footwall. A reverse fault occurs when the hanging wall has been raised in relation to the footwall.

Federal Energy Regulatory Commission: An agency in the U.S. Department of Energy that regulates interstate transfers of electrical energy, certificates for natural gas pipelines, resource development, and other energy actions.

Field effect: Induced currents and voltages as well as related effects that might occur as a result of electric and magnetic fields at ground level.

Floodplain: The lowlands adjoining inland and coastal waters and relatively flat areas, including at a minimum that area inundated by a 1-percent or greater chance flood in any given year. The base floodplain is defined as the 100-year (1.0 percent) floodplain. The critical action floodplain is defined as the 500-year (0.2 percent) floodplain.

Flow: The volume of water passing a given point per unit of time. Same as streamflow.

Formation: In geology, the primary unit of formal stratigraphic mapping or description. Most formations possess certain distinctive features.

General Rural (GR) Zone: The General Rural (GR) Regulatory Zone is intended to identify areas that are: (1) remote and will have no or very low density development (i.e. 1 dwelling unit per 40 acres), (2) in transition from rural to suburban or urban densities on the urban fringe, and (3) remote but where unique developments may occur (e.g. destination resorts, conference centers, etc.). This regulatory zone identifies areas that may have one or more of the following characteristics:

(a) Floodplains. The parcel or area is within the 100-year floodplain identified on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) or, where these maps are unavailable, is within other potential floodplain areas identified by the Washoe County Department of Community Development.

(b) Potential Wetlands. The parcel or area is within a "potential wetland area" as identified by the U.S. Army Corps of Engineers (COE) or, where COE maps are unavailable, is within other potential wetland areas identified by the Washoe County Department of Community Development.

(c) Slopes. The parcel or area has moderate slopes (between 15 and 30 percent) or steep slopes (30 percent or steeper) based on interpretation of the topographic information on the USGS maps for Washoe County.

(d) Public Ownership. The parcel or area is under public ownership.

(e) Remote Location Lacking Infrastructure. The parcel or area is in a remote location that does not have public infrastructure adjacent to or near the site.

Generating unit: The combination of generator and step-up transformer.

Generation: The act or process of producing electricity from other forms of energy.

Generator: A machine that converts mechanical energy into electrical energy.

Groundwater: Water within the earth that supplies wells and springs.

Groundwater basin: Subsurface structure having the character of a basin with respect to collection, retention, and outflow of water.

Hazardous Air Pollutants: Air pollutants that are not covered by ambient air quality standards, but that may present a threat of adverse human health effects or adverse environmental effects.

Hazardous waste: A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in 40 CFR 261.20 through 40 CFR 261.24 (i.e., ignitability, corrosivity, reactivity, or toxicity) or be specifically listed by the Environmental Protection Agency in 40 CFR 261.31 through 40 CFR 261.33.

Historic properties: Under the *National Historic Preservation Act*, these are properties of national, state, or local significance in American history, architecture, archaeology, engineering, or culture, and worthy of preservation.

Hydraulic conductivity: A coefficient describing the rate at which water can move through a permeable medium.

Impacts (effects): As assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the adverse effects, usually measured using a qualitative and nominally subjective technique. In this EIS, as well as in the CEQ regulations, the word impact is used synonymously with the word effect.

Indirect impacts: Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Infrastructure: The basic installations and facilities on which the continuance and growth of a community or state (e.g., roads, schools, power plants, transportation, communication systems) are based.

Intensity (of an earthquake): A measure of the effects (due to ground shaking) of an earthquake at a particular location, based on observed damage to structures built by humans, changes in the earth's surface, and reports of how people felt the earthquake. Earthquake intensity is measured in numerical units on the Modified Mercalli scale. [See Modified Mercalli Intensity scale and magnitude (of an earthquake).]

Intertie: A transmission line that links two or more regional electric power systems.

Interested parties: Those groups or individuals that are interested, for whatever reason, in the project and its progress. Interested parties include but are not limited to private individuals, public agencies, organizations, customers, and potential customers.

Invertebrate: Animals characterized by not having a backbone or spinal column, including a wide variety of organisms such as insects, spiders, worms, clams, crayfish, etc.

Irrigation District: An irrigation district performs only an irrigation function. If other electrical functions are performed, such as residential service or other utility responsibilities, the district may be considered a utility. The term irrigation districts may include agricultural types of districts, such as electrical districts, water delivery districts, and water conservation districts.

Isolated occurrence: A grouping of less than ten artifacts or a single undatable feature. These often consists of redeposited material of questionable locational context that are not related to nearby archaeological sites.

Jurisdictional wetlands: Those wetlands that meet the hydrophytic vegetation, hydric soils, and wetland hydrology criteria under normal circumstances (or meet the special circumstances as described in the U.S. Army Corps of Engineers, 1987, wetland delineation manual where one or more of these criteria may be absent and are a subset of "Waters of the United States").

Kilovolt (kV): The electrical unit of power that equals 1,000 volts.

Lacustrine deposits: Deposits found or formed in lakes.

Level of service: In transportation analysis, a qualitative measure describing operational conditions within a traffic stream and how they are perceived by motorists and/or passengers.

Lithic: A stone artifact that has been modified or altered by human hands.

Load: The amount of electric power required at a given point on a system.

Loop: To tie a substation into an existing transmission line in such a manner as to complete the circuit along that line. Running a double-circuit loop line to a substation would allow an incoming line and an outgoing line.

Low-income population: A population that is classified by the U.S. Bureau of the Census as having an aggregated mean income level for a family of four that correlates to $13,359, adjusted through the poverty index using a standard of living percentage change where applicable, and whose composition is at least 25 percent of the total population of a defined area or jurisdiction.

Loam: A rich, permeable soil composed of a mixture of clay, silt, sand, and organic matter.

Magnitude (of an earthquake): A quantity characteristic of the total energy released by an earthquake, as contrasted to "intensity," which describes its effects at a particular place. Magnitude is calculated using common logarithms (base 10) of the largest ground motion. A one-unit increase in magnitude (for example, from magnitude 6 to magnitude 7) represents a 30-fold increase in the amount of energy released. Three common types of magnitude are Richter (or local) (M_L), P body wave (m_b), and surface wave (M_s).

Major source: Any stationary source or group of stationary sources in which all of the pollutant-emitting activities at such source emit, or have the potential to emit, 100 or more tons per year of any regulated air pollutants.

Mammal: Animals in the class Mammalia that are distinguished by having self regulating body temperature, hair, and in females, milk-producing mammary glands to feed their young.

Megawatt (MW): The electrical unit of power that equals 1 million watts or 1 thousand kilowatts.

Merchant plant: A power plant not owned by a utility.

Mesa: An isolated relatively flat-topped natural elevation.

Meteorology: The science dealing with the dynamics of the atmosphere and it phenomena, especially relating to weather.

Mineral: Naturally occurring inorganic element or compound.

Minority Population: A population that is classified by the U.S. Bureau of the Census as African American, Hispanic American, Asian and Pacific American, American Indian, Eskimo, Aleut, and other non-White persons, whose composition is at least 25 percent of the total population of a defined area or jurisdiction.

Mitigation: The alleviation of adverse impacts on environmental resources by avoidance through project redesign or project relocation, by protection, or by adequate scientific study.

Modified Mercalli Intensity Scale: The Modified Mercalli Intensity Scale is a standard of relative measurement of earthquake intensity, developed to fit construction conditions in most of the United States. It is a 12-step scale, with values from I (not felt except by a very few people) to XII (damage total).

National Ambient Air Quality Standards (NAAQS): Standards defining the highest allowable levels of certain pollutants in the ambient air. Because the U.S. Environmental Protection

Agency (EPA) must establish the criteria for setting these standards, the regulated pollutants are called criteria pollutants.

National Emissions Standards for Hazardous Air Pollutants (NESHAPs): Emissions standards set by the Environmental Protection Agency for air pollutants which are not covered by National Ambient Air Quality Standards (NAAQS) and which may, at sufficiently high levels, cause increased fatalities, irreversible health effects, or incapacitating illness.

National Environmental Policy Act: 42 U.S.C. 4341, passed by Congress in 1975. The Act established a national policy designed to encourage consideration of the influences of human activities (e.g., population growth, high-density urbanization, industrial development) on the natural environment. NEPA also established the Council on Environmental Quality (CEQ). NEPA procedures require that environmental information be made available to the public before decision are made. Information contained in NEPA documents must focus on the relevant issues in order to facilitate the decision-making process.

National Historic Preservation Act (NHPA): (16 U.S.C. 470) Provides for an expanded national Register of Historic Places (NRHP) to register districts, sites, buildings, structures, and objects significant to American history, architecture, archaeology, and culture. Section 106 requires that the President's Advisory Council on Historic Preservation be afforded an opportunity to comment on any undertaking that adversely affects properties listed in the NRHP.

National Pollutant Discharge Elimination System (NPDES) Permit: Federal regulation (40 CFR Parts 122 and 125) that requires permits for the discharge of pollutants from any point source into the waters of the U.S. regulated through the *Clean Water Act*, as amended.

National Register of Historic Places: A list maintained by the Secretary of the Interior of districts, sites, buildings, structures, and objects of prehistoric or historic local, state, or National significance. The list is expanded as authorized by Section 2(b) of the *Historic Sites Act of 1935* (16 U.S.C. 462) and Section 101(a)(1)(A) of the *National Historic Preservation Act of 1966*, as amended.

Native American: A tribe, people, or culture that is indigenous to the U.S.

Native vegetation: Plant life that occurs naturally in an area without agricultural or cultivation efforts. It does not include species that have been introduced from other geographical areas and have become naturalized.

Noise: Unwanted or undesirable sound, usually characterized as being so loud as to interfere with, or be inappropriate to, normal activities such as communication, sleep, study or recreation. (See background noise.)

Nonattainment: An area shown by monitored data or modeling to exceed National Ambient Air Quality Standards for a particular air pollutant.

Nonattainment area: An area that the U.S. Environmental Protection Agency (EPA) has designated as not meeting (that is, not being in attainment of) one or more of the National

Ambient Air Quality Standards (NAAQS) for criteria pollutants. An area may be in attainment for some pollutants, but not others.

Obligate species: Plant species that almost always occur in wetlands (i.e., greater than 99 percent of the time).

Open Access Transmission Service Tariff: Supports the intent of FERC's Notice of Proposed Rulemaking for Open Access Transmission. Tariff requires Western to offer its transmission lines for delivery of electricity when capacity is available.

Ozone: The triatomic form of oxygen. In the stratosphere, ozone protects the earth from the sun's ultraviolet rays but in the lower levels of the atmosphere, ozone is considered an air pollutant.

Paleontology: The study of fossils.

Particulate Matter: Any finely divided solid or liquid material, other than uncombined water.

Parker-Davis Project: In 1954, the Parker Dam Power Project and the Davis Dam Project were consolidated to form the Parker-Davis Project. The major works include Davis (originally named "Bullhead") Dam and Powerplant, Parker Dam and Powerplant, a high-voltage transmission system, and substations which sectionalize the long transmission lines.

Peak capacity: The maximum capacity of a system to meet loads.

Peak demand: The highest demand for power during a stated period of time.

Peaking power/peaking generation: Power plant capacity that is typically used to meet rapid increases or the highest levels of demand in a utility's load or demand profile. Peaking generation is usually oil, gas-fired, or hydropower generation.

Perched aquifer: Groundwater separated from the underlying main body of groundwater, or aquifer, by unsaturated rock.

Perched groundwater: A body of groundwater of small lateral dimensions lying above a more extensive aquifer.

Permeability: The ability of rock or soil to transmit a fluid.

pH: A measure of the relative acidity or alkalinity of a solution, expressed on scale from 0 to 14, with the neutral point at 7.0. Acid solutions have pH values lower than 7.0, and basic (i.e., alkaline) solutions have pH values higher than 7.0. Because pH is the negative logarithm of the hydrogen ion (H^+) concentration, each unit increase in pH value expresses a change of state of 10 times the preceding state. Thus, pH 5 is 10 times more acidic than pH 6, and pH 9 is 10 times more alkaline than pH 8.

Physiography: The science of the surface of the earth and the interrelations of air, water, and land.

Pinal County Comprehensive Plan: Plan which contains goals, objectives, and policies for the natural environment.

Plume: Visible or measurable discharges of a contaminant from a given point or area of origin into environmental media.

Potable: Suitable for drinking.

Prehistoric: Of, relating to, or existing in times antedating written history. Prehistoric cultural resources are those that antedate written records of the human cultures that produced them.

Present value: The worth of future returns or costs in terms of their current value. To obtain a present value, an interest rate is used to discount these future returns and costs.

Prevention of Significant Deterioration (of air quality) (PSD): Regulations established to prevent significant deterioration of air quality in areas that already meet National Ambient Air Quality Standards (NAAQS). Among other provisions, cumulative increases in sulfur dioxide, nitrogen dioxide, and PM-10 levels after specified baseline dates must not exceed specified maximum allowable amounts.

Prime farmland: Soil types with a combination of characteristics that make the soils particularly productive for agriculture.

Production Costs: The cost of producing electricity.

Project: Involves the construction and operation of the natural gas-fired, simple cycle peaking facility, upgrade and extension of existing 230-kV transmission lines, construction of new 230-kV transmission lines, and construction of the 14-mile long pipeline.

Property: The 300-acre property controlled by Sundance.

Public Involvement Plan: Methodology used by the agency to encourage public participation.

Quaternary: The second period of the Cenozoic era, following the Tertiary; also, the corresponding system of rocks. It consists of two epochs, the Pleistocene and the Holocene.

Raptor: Birds of prey including various types of hawks, falcons, eagles, vultures, and owls.

Record of decision (ROD): A concise public document that records a federal agency's decision(s) concerning a proposed action for which the agency has prepared an environmental impact statement (EIS). The ROD is prepared in accordance with the requirements of the Council on Environmental Quality NEPA regulations (40 CFR 1505.2). A ROD identifies the alternatives considered in reaching the decision, the environmentally preferable alternative(s), factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why they were not.

Reliability: The ability of the power system to provide customers uninterrupted electric service. Includes generation, transmission, and distribution reliability.

Region of Influence (ROI): The geographical region that would be expected to be affected in some way by proposed action and alternative.

Resident fish: Fish species that reside in fresh water throughout their lives.

Right-of-way: An easement for a certain purpose over the land of another, such as a strip of land used for a transmission line, roadway or pipeline.

Riparian: Of or pertaining to the bank of a river, stream, lake, or other water bodies.

Runoff: The portion of rainfall, melted snow, or irrigation water that flows across the ground surface and may eventually enter streams.

San Carlos Irrigation Project: Irrigation and Power Agency operated by the Bureau of Indian Affairs, Department of the Interior. The Power Division covers approximately 3,000 square miles in Pinal, Pima, Gila, and Maricopa counties of central Arizona.

Saturated zone: The zone in which the voids in the rock or soil are filled with water at a pressure greater than atmospheric pressure. The water table is the top of the saturated zone in an unconfined aquifer.

SCONOx™: The SCONOx ™ Catalytic Absorption System is a proprietary catalyst developed by Goal Line Environmental Technologies LLC. The system design is based on catalytic oxidation and absorption technologies. The catalytic functions of the system are the oxidation of CO to CO2 and NO to NO2 . The system is designed to reduce both CO and NOx emissions from natural gas-fired power plants to levels below ambient concentrations.

Scoping: An early, open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

Section 106 process: A National Historic Preservation Act (16 U.S.C. §470 et seq.) review process used to identify, evaluate, and protect cultural resources eligible for nomination to the National Register of Historic Places that may be affected by federal actions or undertakings.

Sediment: Material deposited by wind or water.

Sedimentation: The process of deposition of sediment, especially by mechanical means from a state of suspension in water.

Seismic: Pertaining to any earth vibration, especially an earthquake.

Sensitive species: Those plants and animals identified by the Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trend in populations or density and significant or predicted downward trend in habitat capability.

Simple-Cycle facility: A facility which contains combustion turbines similar to a jet engine. Large volumes of air are forced to high pressures in a compressor. Natural gas is injected and combustion occurs. The resulting high-temperature, high-pressure exhaust gases are expanded in a turbine which produces electricity.

Site: Land that contains the generating power plant and the infrastructure occupying less than 50 acres of the Property.

Socioeconomics: The social and economic condition in the study area.

Solid waste: In general, solid wastes are non-liquid, non-soluble discarded materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes include sewage sludge, agricultural refuse, demolition wastes, and mining residues.

Spill: Water passed over a spillway or regulating outlets and not going through turbines to produce electricity.

Stability class: A category characterizing the degree of stability, or absence of turbulence, in the atmosphere.

Standard provisions: One of the initial components, it refers to standard contract terms and conditions included in Sierra Nevada Region transactions.

State Historic Preservation Officer (SHPO): The official within each state, authorized by the state at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the *National Historic Preservation Act.*

Step-up transformer: Transformer in which the energy transfer is from a low- to a high-voltage winding or windings. (Winding means one or more turns of wire forming a continuous coil for a transformer, relay, rotating machine, or other electric device.)

Stratigraphic: Of, relating to, or determined by stratigraphy; the superposition of layers (soil, rock, and other materials) often observed at archaeological sites.

Substation: Facility with transformers where voltage on transmission lines change from one level to another.

Surface water: All bodies of water on the surface of the earth and open to the atmosphere, such as rivers, lakes, reservoirs, ponds, seas, and estuaries.

Sundance Energy LLC: The applicant proposing to construct and operate the Sundance Energy Project.

Switchyard: Facility with circuit breakers and automatic switches to turn power on and off on different transmission lines.

Tap: To tie a substation into an existing transmission line through a connection.

Tap Point: The point where two transmission lines interconnect.

Tesla: Unit of measurement of magnetic field.

Threatened species: Plant and wildlife species likely to become endangered in the foreseeable future.

Threatened or Endangered species: Animals, birds, fish, plants, or other living organisms threatened with extinction by man-made or natural changes in their environment. Requirements for declaring species endangered are contained in the *Endangered Species Act of 1973*.

Traditional Cultural Property/Use Area: Areas of significance to the beliefs, customs, and practices of a community of people that have been passed down through generations.

Transformer: A device for transferring energy from one circuit to another in an alternating-current system. Its most frequent use in power systems is for changing voltage levels.

Transmission line: The structures, insulators, conductors and other equipment used to transfer electrical power from one point to another.

Transmission services: These services may include firm and nonfirm transmission, as well as transmission by a third party. Firm and nonfirm transmission services occur when capacity and energy are received into a system at points of interconnection with other systems and transmitted and delivered to points of delivery from a system. The CVP system may include transmission facilities owned by the Sierra Nevada Region or facilities that the Sierra Nevada Region has an entitlement or contractual right to use. Third party transmission means the Sierra Nevada Region uses transmission facilities other than its own to provide delivery of CVP power to its customers.

Transmissivity: A measure of a water-bearing unit's capacity to transmit fluid: the product of the thickness and the average hydraulic conductivity of a unit. Also, the rate at which water is transmitted through a strip of an aquifer of a unit width under a unit hydraulic gradient at a prevailing temperature and pressure.

U.S. Environmental Protection Agency (EPA): The independent federal agency, established in 1970, that regulates federal environmental matters and oversees the implementation of federal environmental laws.

Vertebrate: Animals that are members of the subphylum Vertebrata, including the fishes, amphibians, reptiles, birds, and mammals, all of which are characterized by having a segmented bony or cartilaginous spinal column.

Volatile Organic Compounds: A broad range of organic compounds, often halogenated, that vaporize at typically background or relatively low temperatures.

Volt: The unit of voltage or potential difference. It is the electromotive force which, if steadily applied to a circuit having a resistance of one ohm, will produce a current of one ampere.

Voltage: Potential for an electric charge to do work; source of an electric field.

Water rights: Permits or licenses issued after application to the State Water Resources Control Board are submitted.

Western Area Power Administration: A power marketing agency of the U.S. Department of Energy (DOE) that was established on December 21, 1977, pursuant to Section 302 of the DOE Organization Act, Public Law 95-961.

Western's Desert Southwestern Customer Service Regional Office (DSW): Manages transmission facilities in the States of Arizona, California, and Nevada.

Wetland: Land or areas exhibiting hydric soil concentrations, saturated or inundated soil during some portion of the year, and plant species tolerant of such conditions.

Wind rose: A circular diagram showing, for a specific location, the percentage of the time the wind is from each compass direction. A wind rose for use in assessing consequences of airborne releases also shows the frequency of different wind speeds for each compass direction.

Yield: A measure of the availability of water to meet authorized purposes sometimes defined in terms of the ability to meet project needs within specific time periods.

APPENDIX C

COMMENT RESPONSE DOCUMENT

C.1 INTRODUCTION

On March 23, 2001, Western Area Power Administration (Western) published the Sundance Energy Project Draft Environmental Impact Statement (DEIS). The DEIS explained the proposed action which is to enter into an interconnection and construction agreement with Sundance Energy LLC (Sundance) for the requested interconnection a planned generator facility to Western's transmission system in the vicinity of Coolidge, Arizona. Following requirements set forth in the National Environmental Policy Act (NEPA) and its implementing regulations, DOE established a comment period to allow the public to review and comment on the Sundance Energy Project DEIS. The public comment period was from March 23 to May 7, 2001.

A public hearing was held at Coolidge High School in Coolidge, Arizona on April 12, 2001. In addition, the public was encouraged to submit comments via the U.S. mail, electronic mail, fax, telephone, and through written and verbal comments submitted at the public hearing. Only the portions of the public hearing transcript containing comments were included in the Comment Response Document (CRD).

Attendance at each meeting and the number of comments recorded as well as documents received via other methods during the public comment period are presented in Tables C.1**B**1 and C.1**B**2, respectively. Some of the attendees chose to make comments during the meetings and their comments were recorded by the court reporter as part of the transcripts. The majority of the commentors at the meetings had prepared written statements that they either read or used to make their comments. These prepared written statements were then submitted as a hand-in comment. These comments were analyzed twice, once as part of the transcripts and once as a stand-alone comment document.

TABLE C.1-1.—*Meeting Attendance and Oral Comments*

Public Meetings	Date	Attendees	Oral Commentors
Coolidge, AZ	April 12, 2001	28	4

TABLE C.1-2—*Document and Comment Submission Overview*

Method of Submission	Documents Received	Comments
Mail-in	9	128
Fax	3	7
Public Hearing Transcript	1	35
Hand-in at Public Meeting	1	12
Total	**14**	**182**

C.2 COMMENT ANALYSIS AND RESPONSE PROCESS

Tables are provided at the end of this section to assist readers in locating comments regarding the Sundance Energy Project DEIS. Comments were identified and categorized by issue (e.g., water resources, air quality, proposed action) and assigned a two digit issue code. An issue code is the term assigned to a general topic to identify similar comments for proper response. Table C.2**B**1 lists general topics and corresponding issue code numbers. This was developed based on the topics discussed in the Sundance Energy Project DEIS. The majority of identified comments were responded to on a one-to-one basis. Comments that are similar in content were given the same response.

TABLE C.2-1.—*Sundance Energy Project EIS Issue Codes*

Code	Issue
01	Land Use
02	Rights-of-Way
03	Air Quality
04	Noise
05	Infrastructure/Waste Management
06	Electric and magnetic field effects (EMF)
07	Water Resources
08	Geology & Soils
09	Biological Resources
10	Cultural Resources
11	Visual Resources
12	Transportation
13	Socioeconomics
14	Environmental Justice
15	Worker and Public Health
16	Facility Accidents
17	Policy/Purpose and Need/Scope
18	No Action
19	Proposed Action
20	Alternative 1
21	Alternative 2
22	Alternative 3
23	Alternative Considered But Eliminated
24	Other NEPA Section
25	Regulatory Compliance **$** NEPA Process **$** Public Involvement/Community Relations
26	Relationship to Other DOE Program/Activities

Table C.2**B**3 lists all individuals, agencies, companies, organizations, and special interest groups that submitted comment documents, including comments and hand-ins from the public meeting attendees. Commentors are listed alphabetically by last name or organization name along with the corresponding page number on which the actual comment document appears. Also listed in this table are the issue code numbers assigned to the comments found within each document.

Reviewers wishing to view comments similar in content should refer to Table C.2**B**4, which lists the issue codes of the general topics and the page numbers where the similar comments are located.

TABLE C.2-2. —*Sundance Energy Project DEIS Public Meeting Attendees, April, 12, 2001*

Douglas Harness
John R. Holt
Clifford J. Jarman
John Bridges
Mary Barger
Catherine Coghill
Jay Moyes
Fred Nials
Shane Collins
Gary Burton
Gary Bates
Ted Mayes
Randy Schroeder
Natalie Bagnall
Louise Senior
Stephen Brittle, Don't Waste Arizona, Phoenix, AZ
Francis Slavin, Phoenix, AZ
John Ryan
Doreen Obermeyer
Jerry Kennedy
Paul Prechel
Stan Barnes
Dana Diller
Janet Henness
Stacy Birmhall
Cody Yost
Jeff Jordan

TABLE C.2-3.—*Index of Commentors*

TABLE C.2-*4.— Index of Issue Codes*

Issue Code	Page Numbers
01	50, 58, 60, 108, 110
02	
03	2, 4, 5, 9, 22, 24, 25, 26, 32, 33, 34, 35, 37,38, 41, 42, 59, 68, 69, 70, 74, 84, 85, 87, 102
04	13, 15, 28, 29, 44, 46, 47, 51, 58, 59, 78, 79, 80
05	17, 18, 48, 81, 106, 107
06	52, 60, 105
07	10, 11, 12, 42, 44, 60, 61, 74, 76, 77, 91, 93, 96, 98, 100, 101, 102
08	4, 5, 47, 69
09	18, 19, 49, 80, 82, 83, 93
10	24, 63, 105
11	19, 26, 83
12	9, 41, 73
13	19, 20, 21,65, 66
14	16, 17, 21, 47, 80, 83
15	7, 8, 19, 39, 40, 59, 72, 83
16	55, 56
17	27, 90, 111
18	
19	2, 9, 31, 54, 67, 74
20	96, 99
21	110
22	1, 27, 113
23	
24	21, 108
25	2, 6, 31, 32, 38, 50, 64, 67, 68, 71, 111
26	62

C.3 CHANGES MADE TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT AS A RESULT OF PUBLIC COMMENTS

During the 45-day public comment period the Western received a total of 147 comments (Table C.1**B**2) on the Sundance Energy Project DEIS. Western considered and responded to all comments received during the comment period. Several major issues emerged from the public comments. Some of these issues necessitated changes in the Sundance Energy Project DEIS. These changes were incorporated into the Sundance Energy Project Final EIS which includes only the amended sections to the Sundance Energy Project DEIS. A summary of the major comments received and the changes made to the Sundance Energy Project DEIS were minor and confined to the reassessment of air quality (Section 4.2), and additional information concerning water resources (Table 4-17), cultural resources (Section 4.8) and cumulative impacts (Section 4.13).

May 7, 2001

John Holt
Desert Southwest Regional Office
WAPA
P.O. Box 6457
Phoenix, AZ
85005-6457
FAX 602-352-2630

Re: Sundance Energy Project Transmission Line Siting
Support of "Alternative 3"

Dear Mr. Holt,

As a local property owner in Pinal County, I support "Alternative 3" as the correct alternative for placement of transmission lines to serve the Sundance Energy Project.

Sincerely,

David Daley

01/22 **Comment No. 01** **Issue Code: 22**
The commentor's preference has been noted.

Don't Waste Arizona
Phoenix, AZ
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May 1, 2001

John Holt, Environmental Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
Phoenix, AZ 85005-6457

Re: Comments on Draft Environmental Impact Statement for Sundance Energy Project DOE/EIS - 0322

Dear Mr. Holt:

Don't Waste Arizona, Inc. (DWA) is a non-profit environmental organization dedicated to the protection and preservation of the Arizona environment. DWA is especially concerned about environmental justice, air pollution, and toxics issues. DWA is headquartered at 6205 South 12th Street, Phoenix, AZ 85040, and may be reached at (602) 268-6110.

On behalf of itself and its affected members, Don't Waste Arizona, Inc. (DWA) provides the following comments on the (in)adequacy of the Draft Environmental Impact Statement for the Sundance Energy Project DOE/EIS - 0322 (hereafter, the DEIS):

The first observation is that this DEIS is overwhelmingly rife with inconsistencies and contradictions. The DEIS also does not properly examine and analyze the impacts and the alternatives. The DEIS ignores a host of federal requirements in the field of environmental regulation. The DEIS appears to have been written deliberately to not examine or analyze properly the negative impacts of the proposed action, as it fails to really examine the environmental injustices and impacts the proposed facility will create, the adverse health impacts caused by the project, and other quantifiable adverse impacts caused by the facility's operation, such as noise. The DEIS, instead of actually examining the impacts and conducting the analysis of the impacts and an examination of the alternatives, gives many issues "honorable mention." That is, the DEIS attempts to merely mention issues and then dismiss them as "insignificant" without any scientific or logical explanation of the characterizations made about the significance of these issues, or even the proper discussion or analyses required by NEPA.. Mere mention of an issue or impact is not sufficient alone to serve as the analysis and exploration of alternatives that are at the heart of, and statutorily required by, NEPA. 01/25 02/19 01/25 (cont.)

AIR QUALITY AND HEALTH ISSUES

The DEIS also does not examine any alternatives to the Sundance facility's proposed simple cycle natural gas electrical power generation. And it does not examine the air pollution control technologies available or that will actually be used. It also does not provide any credible analysis of the impacts caused by a Title V, major source of air pollution being put into the environment of the area. The DEIS admits the facility's impacts on air pollution has triggered the Prevention of Significant Deterioration (PSD) 03/25 04/03 05/03

Comment No. 01 **Issue Code: 25**

The commentor's opposition to the project, and therefore, the EIS is noted. The commentor's overall judgement of the DEIS is based on the sum of his individual comments that are detailed below. Those individual comments which include examination of alternatives, NEPA and Federal requirements, inconsistencies and contradictions are addressed individually.

Part of the commentor's general and detailed comments stem from the DEIS not describing or evaluating the impacts from new air quality control system. The new air quality control system was mandated by the Pinal County Air Quality Control District after the DEIS was printed and distributed. The evaluation of the new system is included in the amended Section 4.2 of the FEIS.

Comment No. 02 **Issue Code: 19**

The DEIS does examine the negative impacts of the proposed action except those associated with the new air quality control system. These impacts are described in the amended Section 4.2 in the FEIS. See response to Comment No. 01 above. See also responses to Comment Nos. 23, 24, 26, and 27 below for discussion of noise and Comment Nos. 29 and 39 for discussion of environmental justice impacts.

Comment No. 03 **Issue Code: 25**

Sundance Energy LLC (Sundance) has applied to the Western Area Power Administration (Western) for an interconnection to Western's transmission lines in the vicinity of Coolidge, Arizona in Pinal County, southwest of Phoenix. The Federal decision is whether to enter into an interconnection and construction agreement with Sundance for the requested interconnection. The only alternatives to this Federal decision is not to allow the interconnection or to allow a different interconnection (different routing).

analysis requirements, with quantifiable impacts 50 km away from the power plant's site, then cavalierly shrugs off these impacts as "insignificant." This alone is disingenuous. Of the thousands of facilities in America that must get air pollution permits, a tiny fraction trigger these PSD requirements, so it must be admitted that a facility required to conduct a PSD analysis is a "significant impact" on that basis alone. Outrageously, on page 2-41, the DEIS purports that there will be "Minimal impacts" [to air quality] due to the construction and operation of the proposed Facility." DWA disputes this assertion. 05/03 (cont.)

The DEIS does not adequately examine the alternative control technologies for the Sundance facility. Long after the work on the DEIS was largely completed, the Pinal County agency that will ultimately issue the air pollution permit notified Sundance that it would require Sundance to utilize a control technology, Selective Catalytic Reduction (SCR). 06/03

SCR entails injecting ammonia into the exhaust across a catalyst bed, causing a reduction reaction that greatly eliminates (controls) NOx. With SCR, NOx can be reduced tenfold from previously achievable levels, to about 2.5 ppm per unit fuel. The agencies that issue air permits are myopic about reducing "criteria pollutants" (CO, VOCs, NOx, SOx, PM10) and ignore other impacts in their considerations. The "risk" from NOx emissions may be traded for the risks from ammonium sulfate, and the public may be getting more risk from the ammonium sulfate. 07/08

The SCR technology requires excess ammonia be injected into the exhaust stream so that there will be enough to react, but the excess ammonia combines with sulfates in the air above these power plants to form tiny particles (PM10) of ammonium sulfate. In fact, a significant proportion of all of the PM10 that power plants are projected to emit will be these ammonium salts. **Ammonium sulfate** specifically causes shortness of breath, coughing, and respiratory irritation/inflammation. PM10 (particulate matter 10 microns or less in size) is so small that your lungs are not able to filter them out. PM10 already is the air pollutant that shortens lives (respiratory and cardiac problems) and creates asthma and other respiratory ailments. Now with the effect of the ammonium sulfate, the PM10 will be even more of a problem, perhaps exponentially worse. Each power plant will put out 20-35 tons per years of the ammonium sulfate PM10, and another 80-100 tons per year of "regular PM10," so it is easy to see there will be a cumulative and adverse effect.

Because under the Clean Air Act, all PM10 is assumed to be created equal and assumed to be as harmful as mere dust, the regulatory agencies that issue air permits ignore the known extra and specific chemical hazards associated with some of this particulate matter. This unscientific approach will have especially dangerous and perhaps lethal consequences in areas where power plants using SCR technology operate and proliferate. There is actually reason to believe that it will sicken many and even kill some people. Power plants putting as much as 100 tons of a respiratory irritant into the air, along with hundreds of tons of other particulate matter, will obviously have an adverse impact on people's health.

There are already studies showing that of all the criteria pollutants, PM10 is the pollutant that causes the illnesses and deaths. A December 14, 2000, study titled, "Fine Particulate

Comment No. 03 (cont.) **Issue Code: 25**

The decisions associated with siting, design, construction, and operation of the proposed Facility are not Federal decisions. These decisions are regulated, approved, and overseen by the State of Arizona. Therefore, different sites, designs, and operational factors are not alternatives to the Federal decision. However, the impacts resulting from these decisions are interconnected with the decision to allow interconnection. If no interconnection was allowed, the proposed power plant would not be built regardless of design. Therefore, the potential impacts from the siting, design, construction and operation of the proposed plant are connected to the Federal interconnection decision. This EIS examines the impacts of the interconnected actions, even those actions that are not Federal decisions.

Comment No. 04 **Issue Code: 03**

The decision as to which air pollution control technology to implement at the proposed Facility is up to the Sundance and the appropriate state and/or local regulatory agencies. It is not a Western's decision. However, the impacts associated with the outcome of that decision are discussed in this EIS. It is the charter of the air quality regulatory agency to analyze the applicant's permit requests, and regulate the manner in which a project may operate with respect to air quality laws and regulations.

In conjunction with the Sundance Energy DEIS, a PSD air permit application was submitted to the Pinal County Air Quality Control District (PCAQCD), the regulatory agency charged with administering air quality laws and regulations in Pinal County. As part of the PSD application, an analysis of control technologies was presented and evaluated. A draft permit and associated Technical Support Document were issued for public review April 27, 2001. These public documents may be examined by contacting the PCAQCD.

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Phoenix, AZ
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Air Pollution and Mortality in 20 U.S. Cities, 1987-1994," published in the *New England Journal of Medicine*, concluded, "There is consistent evidence that the levels of fine particulate matter in the air are associated with the risk of death from all causes and from cardiovascular and respiratory illnesses. These findings strengthen the rationale for controlling the levels of respirable particles in outdoor air."

And there are other studies that finger sulfates specifically as causing increased mortality. A study titled, "Particulate air pollution as a predictor of mortality in a prospective study of U.S. adults, published in March 1995 in the *American Journal of Respiratory and Critical Care Medicine*, states, "Increased mortality is associated with sulfate and fine particulate air pollution levels commonly found in U.S. cities." A German study, "Environmental air pollution and lung disease in children, states" Sulphates will increase the use of medication and decrease lung function in asthmatic children."

The DEIS is particularly unscientific in this regards. Table 3-2, on page 3-7, shows the 24-hour maximum ambient air concentration of PM10 in Coolidge as 83.6 ug/m3, with the NAAQS Standard at 150 ug/m3. It shows the annual ambient air concentration of PM10 in Coolidge as 39.6 ug/m3, with the NAAQS Standard as 50 ug/m3. This is without the additional burden of the PM10 from the proposed Sundance facility. The additional PM10 from Sundance, which will emit so much PM10 that it requires a PSD analysis, will undoubtedly move the ambient air concentrations of PM10 upwards, and closer to the limits of the NAAQS Standard. There obviously will be an impact on health and mortality in the area near Sundance as the power plants emissions of PM10 are added onto the burden that is already there. The DEIS never deals with this obvious information. The impacts of the additional PM10 must be fully analyzed and addressed. Again DWA references the December 14, 2000, study titled, "Fine Particulate Air Pollution and Mortality in 20 U.S. Cities, 1987-1994," published in the *New England Journal of Medicine*. In this study, the investigators used a single analytic approach to examine the association between PM10 concentrations in a given 24-hour period and the numbers of deaths reported on the following day in 20 of the largest cities and metropolitan areas in the United States, including Phoenix. The study found an average increase in the rate of death from all causes of about 0.5 percent for every increase in the PM10 concentration of 10 micrograms per cubic meter. The PM10 concentrations were positively associated with daily mortality rates in most of the 20 cities studied and at concentrations well below the current 24-hour standard of 150 micrograms per cubic meter. In fact, the 90th percentile of the distribution of daily values was below the 24-hour standard in each of the 20 cities. Moreover, the association was specific to PM10. The finding of a strong association between the PM10 concentration and the rate of death from cardiovascular and respiratory causes offers support for the idea that the concentrations of particulate air pollution influence mortality.

08/03

After reviewing the science, anyone who would claim that the Sundance Energy facility would create minimal impacts is totally irresponsible. It is also with complete scientific basis to say that more asthma and other respiratory diseases will be caused or aggravated by this major pollution source. Of course, this kind of bogus DEIS and bogus NEPA process is to be expected when agencies are not objective and merely go through the motions of an essentially counterfeit NEPA process in order to serve their corporate

08/03 (cont.)

Comment No. 05 **Issue Code: 03**

A PSD New Source Review is triggered if estimated emissions of any of the criteria pollutants exceed 250 tons per year. Key components of the PSD review are a determination of Best Available Control Technology and an analysis of ambient air impacts. If the ambient air impacts exceed the EPA's "significance criteria," then a cumulative air quality analysis is completed to ensure that the PSD Class II incremental increases are not exceeded. However, in no case may the facility's emissions cause an exceedance of the National Ambient Air Quality Standards (NAAQS) established by the Clean Air Act. The analysis for the proposed Facility indicated that the maximum ambient air impact for all pollutants, and applicable averaging periods were less than 4% of the NAAQS. These maximum impacts were on the top of a ridge approximately seven miles west/northwest of the proposed Facility. In Coolidge, as well as at residences within 5 miles of the proposed Facility, the maximum impacts were less than 1% of the NAAQS.

Comment No. 06 **Issue Code: 03**

See response to Comment No. 05 above.

Comment No. 07 **Issue Code: 08**

The new air quality control system was mandated by the Pinal County Air Quality Control District after the DEIS was printed and distributed. The FEIS includes the evaluation of the new system. See the amended air quality analysis in Section 4.2 in the FEIS that incorporates the use of SRC to reduce NO_x emissions by 80%.

Comment No. 08 **Issue Code: 03**

See the amended air quality analysis in Section 4.2 in the FEIS. The NAAQS for the annual PM_{10} concentration is 50 $\mu g/m^3$. The annual average PM_{10} ambient levels in Coolidge have been recorded as 39.6 $\mu g/m^3$ or 79% of the NAAQS. The maximum impact analyzed for the annual PM_{10} from the proposed Facility was 0.93 mg/m^3 or 0.19%

masters, urged on by the bureaucrats who fawn upon them.

Further, the fact that the SCONOX technology, which is also considered BACT by EPA Region 9, is not at all considered or evaluated as an alternative to SCR, belies the deficiencies of this DEIS. SCONOX, if used at Sundance and not the SCR technology that it currently proposes and that is not even explored by the DEIS, would eliminate the ammonia, the ammonium sulfates, the inherent risks of storage and transportation of the ammonia, and would actually control the emissions of criteria air pollutants better than the SCR technology. 09/03

On page 4-10, in the discussion of Hazardous Air Pollutants, the potential ambient air impacts were voluntarily evaluated using the Arizona Ambient Air Quality Guidelines (AAAQG) as a criteria to evaluate potential health risk, with the assertion that if the "predicted concentrations are below the AAAQG, then it can be concluded that no health risks result." The AAAQG, and the methodology used to produce them, have never been peer-reviewed, and represent an entirely unproved standard. Further, neither the AAAQG nor the DEIS in any other way consider or evaluate the synergistic or cumulative effect of these Hazardous Air Pollutants, the criteria pollutants that the Title V major source will emit, or the aforementioned ammonium sulfates. But NEPA ***specifically*** requires an examination of the cumulative effects of a proposed significant federal action, so this DEIS is invalid in these respects, and must be undertaken again with a close eye on the statutory requirements. 10/03 11/25

EMERGENCY AND RISK MANAGEMENT PLANNING ISSUES

As if that wasn't enough, there is the issue of the ammonia stored on-site at the power plant and the additional risks the ammonia presents. It will be common to see 15,000 to 20,000 gallon tanks of ammonia stored at this facility. Anhydrous ammonia is particularly dangerous, but even aqueous ammonia is risky. A catastrophic release of ammonia from a 15,000 to 20,000 gallon tank would be enough to kill and injure people a few miles away, depending on weather conditions. Facilities with this much ammonia on-site have to report and participate in a new federal program required by 112r of the Clean Air Act called the Risk Management Program if the ammonia on-site is 20% or greater concentration. Otherwise, the facility will still have to file Tier Two reports as required by the federal Emergency Planning and Community Right-To- Know Act (EPCRA) and develop a facility emergency plan that includes methods of notifying the public and the response agencies that a release has occurred. For a perspective, there are less than 18,000 RMP facilities in the entire nation reporting to the EPA. 12/15

In the rural areas, such as the Sundance facility site, there will not be sufficient resources to respond quickly enough to prevent deaths and injuries. The responders simply do not have the equipment and infrastructure to handle a large-scale hazmat incident. Pinal County relies on other counties' response for these types of hazmat response. A responsible, legitimate NEPA process would have made contacting the Pinal County Local Emergency Planning Committee (PCLEPC) to gather this information part of its process. In the event of a catastrophic release of ammonia from the Sundance facility or from a transportation incident, people can shelter from the ammonia, but it will infiltrate 13/15

Comment No. 08 (cont.) **Issue Code: 03**

of the NAAQS, a 2.4% increase over the measured background level. When Sundance's maximum impact is added to the background, the total is 40.53 $\mu g/m^3$, or 81% of the NAAQS. The NAAQS were established by the Clean Air Act to protect the public health and welfare with an adequate margin of safety. A level of 80% of the NAAQS provides the protection mandated by the Clean Air Act.

Comment No. 09 **Issue Code: 03**

See response to Comment No. 04 above. The application of SCONOx was evaluated in the Best Available Control Technology of the PSD permit application submitted to the Pinal County Air Quality Control District. SCONOx was rejected for the proposed Facility because it is not technically feasible for simple cycle turbines because their exhaust temperature is higher than the optimal operating temperature range of SCONOx.

Comment No. 10 **Issue Code: 03**

The AAAQGs were developed by the Arizona Department of Health as health-based guidelines for contaminants in air. AAAQGs are residential screening values that are protective of human health including children. The AAAQGs are used as tools to decide which air emissions are at a level that they should be evaluated further. Chemical concentrations in air that exceed AAAQGs may not necessarily represent a health risk, but further modeling or calculation is required to assess whether there is a true threat to human health.

While the AAAQGs are not peer reviewed in the way a scientific paper is, they were derived from occupational exposure limits established or recommended by the U.S. Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety and Health (NIOSH), and the National Institute

their homes within a given amount of time and reach harmful or even lethal concentrations before the responders can arrive. When the release occurs, unless a rescuer arrives in a timely manner with his/her own SCBA (self-contained breathing apparatus) and one for each person to be rescued, there will be fatalities and injuries. There are not enough SCBA available to provide this response. That is what planning entities exist to plan for, yet as stated, the DEIS doesn't even investigate or address this. And upon investigation, the only conclusion is that there will be unpreventable deaths and injuries if there is a catastrophic release of ammonia as aforementioned. This is not an "insignificant" impact. The may also be issues of evacuation routes sufficient to allow a timely evacuation. And there will be issues of notification and preparation. 13/15 (cont.) 12/15 (cont.)

Both rural and urban areas will see a heightened risk along the transportation route of the ammonia. A tanker of ammonia could harm people 2-3 miles on either side of the transportation corridor, in the event of an accident that ruptures the tanker. Only one out of four chemical spills are transportation incidents. Far more occur during the off-loading of a chemical at the industrial site. 14/12

Further, the SCR technology requires the gradual release of ammonia into the exhaust of the power plant. Ammonia is the most often spilled or unintentionally released industrial chemical in the United States, and this ammonia is released from facilities that are designed to completely contain the ammonia but nonetheless have accidental releases. The risks of using a system like the SCR technology that allows and depends upon the constant and gradual release of ammonia into the environment must be examined and quantified, with a review of the accident and release records at other facilities that are using the SCR technology. 15/03

None of these issues are examined at all, yet all are federal environmental regulations or directly relevant. This is a glaring error in the DEIS.

There is no examination at all in the DEIS of other control technologies, such as SCONOX. SCONOX does not require the use of ammonia, so no ammonium sulfates are formed, and it actually reduces other pollution, such as VOCs, CO, and SOx. Until the full review and analysis of these and other appropriate control technologies is undertaken, the DEIS is entirely deficient. 16/03

FACILITY DESIGN ALTERNATIVES

Actually, there should be a review of the plan to use natural gas as a fuel and the types of electrical power generating plants that could be used. There is no examination of producing the peaking power that Sundance is planned to do in another way or at another site. For example, there will be plenty of baseload power plants being built that could produce extra power to be used when peaking power is needed. Using excess power generated at baseline plants to convert water into hydrogen and oxygen, then using the hydrogen as a fuel for peaking power, could be an alternative. This alternative would produce no carbon dioxide, no carbon monoxide (CO), virtually no SOx, far less particulates, and far less NOx than the currently proposed facility. There would also be more oxygen in the air as a result. 17/19

Comment No. 10 (cont.) **Issue Code: 03**

for Environmental Health Science (NIESH). The most protective standards or recommended levels from the U.S. and other countries were used. Many of these standards have undergone peer review as well as regulatory and legislative review.

See the amended air quality analysis in Section 4.2 in the FEIS. Hazardous air pollutants were evaluated against the AAAQG and all impacts except the annual averaged formaldehyde are predicted to be less than 1% of the AAAQGs. The annual formaldehyde value was 7% of the AAAQG. The adequacy of standards that have been implemented by Federal, state, and local agencies are beyond the scope of NEPA process.

Comment No. 11 **Issue Code: 25**

The cumulative effects of air pollutants for the entire Phoenix area are discussed in Section 4.2 in the FEIS. The synergistic effects of combinations of chemicals are only beginning to be explored. There are very few human studies on multiple pollutant exposure. Studies to date have shown that there are possible additive or synergistic effects when ozone combines with sulfur dioxide, nitrogen dioxide, carbon monoxide, sulfuric acid, or other particulate aerosols. These synergistic effects can include greater decreases in lung function for some people concurrently exposed to ozone and other pollutants than for either pollutant alone. Exercise, smoking status, and existing pulmonary disease can also result in increased sensitivity to individual pollutants.

Ammonia sulfates were not evaluated in DEIS because the DEIS was issued before the Pinal County Air Quality Control District decided that the proposed Facility should use the SCR method. The FEIS discusses the impacts associated with the use of this air quality control method at the proposed Facility in the amended air quality analysis in Section 4.2 in the FEIS.

METHODOLOGY

There are also some very strange things in the DEIS. For example, on page 2-5, there is this statement: "Under optimal ambient conditions with the air temperature near 20 (degrees) F, Configuration 2 could generate about 647 MW." It is almost absolutely unlikely that this climatic condition will occur in the area of the facility, especially when the average minimum temperatures are reviewed at Table 3-1 on page 3-5. It is more likely that the temperature would be 100 degrees F! And since it is a peaking power plant, the likelihood of this type of cold causing the use of the peaking power plant is nil. This is, however, a classic example of how this DEIS rambles along with disingenuous analysis and circumstance, instead of focusing on reality and the required analysis and examination of alternatives that NEPA requires.

18/03

The discussion on 2-7 regarding the generating facility is outdated and clearly shows that the design of the power plant is different now than what the DEIS states it to be. For example, the 6,500 hours of operation is not at all correct. The facility will get an air permit allowing 8,760 hours of operation.

19/03

WATER ISSUES

The discussion about water use that starts on 2-9 does not fully examine the impacts of where the water will come from. To fully examine this, the actual source of the water (CAP or groundwater) needs to be stated. If the CAP water will come from the Gila River Indian Community or the San Carlos Apache Tribe, then the DEIS must examine the impacts of this on those tribal entities. If it will be from groundwater pumping, then the assertions made in the DEIS are questionable, at a minimum.

20/07

On 4-31, the DEIS states that subsidence from dewatering has occurred within the basin, but that the groundwater pumping that might result from the operations of the proposed Sundance facility is not expected to cause subsidence *in the area*. (Emphasis added.) This is disingenuous. The DEIS provides no substantiation for this conclusion. Besides, if subsidence within the basin is already occurring due to groundwater pumping, it is *obvious* that pumping more groundwater from the same aquifer will result in more subsidence *somewhere* in the basin. The analysis ignores this obvious fact, trying to divert attention to the subsidence impact by making the unsubstantiated and undefended claim that subsidence is not expected to occur in the area, and is therefore deficient in examining the impacts of the proposed groundwater pumping for providing the water needs of the facility.

21/07

The discussion on 4-33 regarding the blended wastewater to make it suitable for irrigation does not discuss or examine the effect this will have in speeding up the salinization of the soils or groundwater. These impacts must be fully examined and quantified.

22/07

NOISE

Comment No. 11 (cont.) **Issue Code: 25**

The ambient air impacts analyzed for Hazardous Air Pollutants (HAPs) were far below the AAAAGs established to protect public health. The combination of miniscule ambient air impacts from the proposed Facility and no other significant sources of HAPs nearby would result in a meaningless analysis.

Comment No. 12 **Issue Code: 15**

The proposed Facility would have the capacity to store up to 30,000 gallons of aqueous ammonia for injection into the SCR air pollution control system. The aqueous ammonia solution, less than 20% ammonia and more than 80% water, would be stored in two 15,000-gallon tanks on the proposed Site. Upon arrival at the Site, ammonia would be pumped into one of the two ammonia storage tanks (see Figure 2-1, Proposed Facility Configuration). A concrete containment area would be constructed around the tanks with a sufficient volume to handle the discharge of one 15,000-gallon tank. After the ammonia hose is connected from the truck to the tank, a second vapor recovery hose would be connected from the top of the tank back to the truck to contain any residual vapors that may be in the ammonia tank. In the unlikely event of spills during the delivery of ammonia or during operations, water hoses would be immediately available to dilute the spilled ammonia within the containment area. Operation of the SCR would not involve any high pressure release of ammonia vapor. The aqueous ammonia would be pumped from the storage tanks to the SCR reactor chamber in liquid form. The ammonia would be heated sufficiently for vaporization, and then injected into the SCR for mixture with the exhaust stream.

There are discussions about the noise impacts in different parts of the DEIS, and there are contradictions and illogic illustrated in the handling of the noise impacts. The DEIS states that the ambient background noise level at the proposed site is about 40-45 dBA (3.3.1 at 3-9), and that the additional noise from the power plant at start-up and shutdown will be an additional 10 dBA, which puts the noise level up to about 55 dBA. This would bring the noise level up to about the level of noise at a commercial area.

23/04

That noise level certainly would destroy the rural nature and atmosphere of the people living near the Sundance power plant! This is a real quality of life issue. Further, the DEIS states on 4-18 that "Changes in sound levels of +/-10 dBA within a short timespan may be perceived as **dramatic**..." (Emphasis added.) But the DEIS also purports that "Normal operation excludes intermittent activities such as start-up, shut down, and any emergency or upset conditions." This is really disingenuous, and betrays the pro-facility agenda of the DEIS. This is a peaking power plant, so it is designed to start-up and shut down often. To exclude start-up and shut down from "normal operations" is a fundamental, inappropriate, contradiction to logic.

24/04

The real story here is that local area residents, a low-income, ethnic minority community, will get admittedly "dramatic" noise disturbances at least daily, and more likely many times per day, and that makes the additional noise a significant impact. If this were to be a power plant that operated continuously, a baseline power plant, then the human ear could get accustomed to the noise and tune it out, but that is not the case here. The people who live there will get the noise of a suburban setting foisted upon them in a "dramatic" manner, and not the noise level of the rural setting that they currently enjoy. To not characterize this additional noise as a significant impact is unconscionable.

25/04

Desert animals will also be affected by this noise. Predators, which use sound to track their prey, will be unable to hear their prey when the power plant starts up or shuts down and creates a "dramatic" sound event.

26/04

To amplify the discussion on noise issues, the DEIS never looks at the cumulative effect of all of the noise from all the separate units at the Sundance facility. The DEIS looks at the additional noise from the power plant at start-up and shutdown, and claims it will be an additional 10 dBA, which does not examine the cumulative noise from all units starting up, which must be considerably more than just one unit starting up, the same way the noise from one car engine starting up is less than the noise of ten car engines starting up. This is yet another logic flaw in a very flawed document.

27/04

ENDANGERED SPECIES ISSUES

Desert plants and endangered species are also not adequately or even scientifically examined in the DEIS. The DEIS acknowledges that hedgehog cactus is an endangered species and that the hedgehog cactus occurs on the proposed site and along the proposed pipeline route (3-37). Later (4-40), the DEIS has the unfounded audacity to proclaim, "No highly safeguarded cacti were observed in the proposed Project area..." This is another of those contradictions that the DEIS is rife with. This contradiction/misrepresentation is part of a disturbing pattern in this DEIS, which smacks

28/09

Comment No. 13 **Issue Code: 15**

NEPA guidelines do not specifically require an assessment of emergency response capabilities, and the assessment of potential impacts of accidents does not usually take into account any emergency response. The impacts of accidents on the general public are assessed as if no mitigation would occur. It is often assumed that a person with no protection is located in the worst place for 24 hours a day, 365 days a year. Impacts to the general public are usually assessed using maps of entire populations in the area. No evacuations are assumed. Any emergency response plans, or evacuation capabilities are usually discussed in terms of mitigation of the potential impacts of an accident. Since the SCR air quality control method has been designated by the Pinal County Air Quality Control District, an assessment of potential accidents associated with the storage and transportation of ammonia has been included in the FEIS.

The proposed Facility would rely on both onsite fire and local fire protection services. Raw water storage tanks would be the source of water for fire suppression. An emergency diesel-fueled-fire pump would enable pumping of storage water to any potential fires for initial suppression of fire. For large fires, response would be from either the Arizona City Fire District, headquartered south of Casa Grande, approximately 15 miles south of the proposed Facility, and the Apache Junction Fire District, headquartered approximately 20 miles north of the proposed Facility. Municipal fire departments are also in Casa Grande and Florence, both within 10 miles of the proposed Facility. The Gila River Emergency Medical Service responds to hazardous materials spill incidents and emergency medical services. The Casa Grande Regional Medical Center provides 24-hour medical emergency service with a staff of 82 medical people.

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of racketeering and/or fraud.

HAZARDOUS WASTES/ENVIRONMENTAL JUSTICE ISSUES

On 4-23, the DEIS states, "The Project would dispose of hazardous materials at a hazardous waste facility either in Coolidge or another location in Phoenix." This ignores well-known environmental justice issues in that there has been a civil rights/environmental injustice claim filed with USEPA regarding the siting and permitting of the Heritage hazardous waste facility near Coolidge (which is the one the DEIS refers to) as well as a civil rights/environmental injustice claim filed with USEPA regarding the proposed permitting of the Innovative Waste Utilization hazardous waste facility in Phoenix. All of the hazardous waste facilities in Phoenix that accept hazardous wastes generated off-site are in low-income communities of color, which raises civil rights and environmental justice issues. That the DEIS does not investigate these issues puts it on track to violate the federal Civil Rights Act and related laws, and further constitutes a violation of NEPA. 29/14

The impacts from spills of hazardous fluids are not addressed. Instead, the DEIS in essence purports that there won't be any spills, which is an entirely unrealistic and unsubstantiated assurance. There could be a very significant impact to the groundwater from a spill of hazardous fluids, as the groundwater is only 75 feet below the surface. A realistic review of the impacts of a spill of these hazardous fluids must be undertaken to comply with NEPA requirements. 30/05

VISUAL RESOURCES

The discussion of Visual Resources that begins on 4-49 is strange. It does not provide anywhere the basis of its statements and claims. There are no surveys of local people or others to show what people actually think. Among its more glaring deficiencies, it fails to examine or even mention the appearance of the plume of air emissions, including steam, from the facility. The light from the facility at night will be significant, and further destroy the inherent rural desert charm for local residents. The light may also affect the desert animals, many of which are nocturnal. 31/09 32/09

On 4-52, in the discussion regarding the visual impacts to the Casa Grande National Monument, consultations with the Hopi Tribe, Gila River Indian Community, and Ak-Chins are mentioned as ongoing. That would make premature any conclusion that there are no impacts. 33/11

HEALTH IMPACTS FROM PAVING ROADS

Some people are sickened by inhaling asphalt fumes; some are permanently harmed by this. The health impacts on local people by the road paving is not examined. 34/15

SOCIOECONOMICS

Comment No. 14 **Issue Code: 12**
Since the SCR air quality control method has been designated by the Pinal County Air Quality Control District, an assessment of potential accidents associated with the storage and transportation of ammonia has been included in Section 4.2 in the FEIS.

Comment No. 15 **Issue Code: 03**
The use of SCR was not determined until after the issuance of the DEIS. The impacts of the SCR method have been assessed and are included in the FEIS in Section 4.2

Comment No. 16 **Issue Code: 03**
See response to Comment No. 04 above.

Comment No. 17 **Issue Code: 19**
See response to Comment Nos. 03 and 04 above.

Comment No. 18 **Issue Code: 03**
See the amended air quality analysis in Section 4.2 in the FEIS. The referenced discussion indicates that 20 degrees Fahrenheit is the optimal temperature to get the maximum output from the turbines. This temperature is not expected, therefore, the nominal output is 600 megawatts or less at expected temperatures. NEPA documents are expected to discuss the capability of the systems being analyzed.

Comment No. 19 **Issue Code: 03**
The air permit requires a conservative calculation of the potential air pollution of the proposed Facility. Initially the preliminary air permit calculations used the conservative estimate of 8,760 hours. The amended air permit calculation now uses a conservative estimate of 7,500 hours. The proposed Facility would be a peaking power plant. It would not be economical to run all of the time. The 6,500 hours of operation is the expected annual maximum for operation and is the

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The impacts of the short-term migration of workers to the area and their leaving later are not examined. There is also no explanation why local people will not be recruited to work at the facility during any phase of construction or operation.

Impacts to the local communities will be significant. Sundance/PPL (Pennsylvania Power & Light) has already alluded that an out-of-state contractor will be utilized for the construction phase of this project. We are currently witnessing the invasion of out-of-state workers from three power plants currently under construction in Arizona. The Griffin Plant in Kingman, the Reliant plant in Casa Grande and the De-Moss plant in Tucson. These impacts from out-of-state workers have devastating effects on the local communities that are felt for years on the local and state tax bases because of the extra but temporary effects on the local infrastructure, including law enforcement issues. None of this is examined or analyzed in the DEIS. 35/13

The DEIS for this proposed project has been very careful not to mention any negative impacts. In its own words however, it states: " The local economy would be affected by direct project spending and induced economic effects which would occur as a result of employee and business spending income within the area." The impacts of short-term migration of up to three hundred and thirty (330) construction workers to the local area are not examined. However, when out of state contractors are utilized as mentioned above we know that a minimum of 70 to 80% of the workforce will be imported. These workers travel along with these companies from job to job, and state to state. Some will bring their families with them. These workers families move into trailer courts or rent apartments. When their children are placed into community schools burdens are imposed upon these school districts to accommodate for overcrowding of classrooms, without any financial assistance. Since out-of-state workers are not required to pay any property taxes this burden is placed on an already strained school district tax base. It constitutes a disproportionate, adverse impact. 36/13

In 4.11.1 of the DEIS. Sundance/PPL admits on page 4-58 that no agreement has been reached for the treatment of local property taxes. However, it's own (on-going thus far) negotiated tax revenues of $75 million amortized over twenty years are but a fraction of the current liabilities that current business owner must pay. It has already been proven in many communities throughout the country and within our own state that when these out-of-state workers come into our communities that DUI's, crime and drug use instances will increase. Our community's law enforcement agencies will inure added expenses in order to deal with these increases. Again, local & state taxpayers will be asked to pay this unnecessary tax burden imposed upon them. 37/13

Since Sundance/PPL (Pennsylvania Power and light) will be the owner/operator of this facility, it is highly feasible that the eight to twelve permanent employee's will be imported from out-of -state as well. The DEIS did not evaluate these and other potential social impacts at all. Instead it simply reprinted its own vague assurance it may hire locally. The DEIS did incorporate by reference its own induced economic effects but, has been obviously been self-promoting. With this in mind it can be assumed that the developer paid for this document and cannot be expected to be an objective study. The developer's study did not sufficiently analyze the scope of the socio-economic impacts, 38/13

Comment No. 19 **Issue Code: 03**

estimate used for calculating water consumption and other impacts. See the updated air quality analysis in the amended Section 4.2 in the FEIS that reflects the operating conditions listed in the draft air permit issued for public comment.

Comment No. 20 **Issue Code: 07**

The source of CAP water would be a contract for excess CAP water delivery between Sundance and Central Arizona Water Conservation District (CAWCD). The contract has been pre-approved by CAWCD's Board of Directors and was offered to Sundance on January 12, 2001. Its execution is pending completion of a wheeling agreement between Sundance and Hohokam Irrigation District (HID) to transport the water from CAWCD's main canal through Hohokam's existing canals to the proposed Facility. The existing canal adjacent to the proposed Site has significant excess capacity beyond the needs of the proposed Project without upgrade or modification requirements. Wheeling service by HID has been assured by its manager and board members. The wheeling contract is currently in the negotiation and drafting stage, and must be executed before CAWCD will execute the offered CAP Excess Water contract. CAP water for the proposed Project would not come from any Indian communities or tribes.

Sundance is considering, and is in preliminary negotiations concerning the possible provision of CAP water from parties who hold existing long-term, firm subcontracts from CAWCD for substantial amounts of water not currently utilized or anticipated by those parties to be fully utilized during the life of the proposed Project. Subcontractors include several Indian tribes and communities. No such commitment or arrangement has been discussed by Sundance with any Indian CAP allotee.

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therefore, the DEIS be sent back for a more in-depth analysis, one that is not biased, one that is consistent with the statutory requirements of NEPA. 38/13 (cont.)

ENVIRONMENTAL JUSTICE 4.12

The DEIS' section on environmental justice ignores the 200+ Hispanics that live around Eleven Mile Corner. DWA disputes the DEIS assertion that there are "no adverse impacts to human health or the environment." Curiously, the DEIS contradicts itself starting on page 4-63 when it discusses "Unavoidable Adverse Impacts." 39/14

AMERICANS WITH DISABILITIES ACT

The school at Eleven Mile Corner is for disabled children. Because these children are disabled, the Americans with Disabilities Act must be reviewed in this NEPA process in the context of whether the power plant's air emissions, ammonia hazards and risks, noise, and cumulative impacts constitute a disproportionate adverse impact upon these disabled children. 40/24

Sincerely,

Stephen M. Brittle

Stephen M. Brittle
President

ATTACHMENTS

Comment No. 20 (cont.) **Issue Code: 07**

The worst case scenario, a hypothetical assumption that no CAP water being delivered to the proposed Facility, would require complete reliance on existing or new groundwater wells on the proposed Property. This worst case hypothetical scenario has been analyzed by independent professional hydrologists and by the Arizona Department of Water Resources (ADWR.) They have also analyzed the impact of the normal case scenario of projected emergency backup reliance on groundwater during anticipated short-term unplanned and planned outages of the CAP delivery system. See *Memorandum* dated November 30, 2000 and supplemental *Memorandum* dated March 15, 2001, by Greg Wallace, ADWR Chief Hydrologist. ADWR has determined that under either scenario (intermittent backup use of groundwater or full reliance on groundwater for the life of the proposed Facility), the impact on the local groundwater table and groundwater rights and uses by surrounding landowners would be minimal and consistent with the Pinal Active Management Area Management Plans.

Since the proposed Facility would be a simple cycle facility with no cooling towers, there would be no impact to groundwater because of the relatively small water requirement from a very large regional aquifer. ADWR, in its November 30, 2000 Memorandum, notes the dramatic rise in the local water table in recent years as follows: *"Since the mid-1980s, water levels in the area around the proposed plant site have risen by as much as 120 feet."* Groundwater use by the proposed Project, for the worst case hypothetical scenario is anticipated to only slightly decrease the rate of the water table recovery.

Comment No. 21 **Issue Code: 07**

See response to Comment No. 20 above. Regional subsidence is an *historical* phenomenon not common to all lands or soils in the region, but nonetheless extensive in some locations in Pinal County.

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Comment No. 21 (cont.) **Issue Code: 07**
Historically, subsidence has been the result of severe groundwater overdrafting.

However, in the last two decades, there have been dramatic reversals of overdrafting conditions in the region (see ADWR Memorandum cited in Comment No. 20 which confirms a substantial rise in local water tables). As discussed in the DEIS subsidence due to historical groundwater pumping would not be further impacted by the proposed Project. ADWR has confirmed that the minor amount of water required by the proposed Facility, in the context of a rapidly rising water table in a very large aquifer, would have minimal impacts of only a slight decrease in those recovery rates.

The proposed Project plan is to use groundwater for backup only. This would significantly decrease the amount of groundwater use at the Sundance irrigated property compared to historical and recent irrigation pumping of groundwater. Therefore, the proposed Project would decrease any risk of subsidence due to historical groundwater pumping.

Comment No. 22 **Issue Code: 07**
The quality of discharged water would be equal to or better than the quality of the existing groundwater wells located on the proposed Property. Water from these wells historically has been used for irrigation in the area around the proposed Facility. Typical total dissolved solids (TDS) values of this groundwater source have been near 2,700 mg/L. Sundance would mostly use CAP water to operate the proposed Facility. Wastewater from the water treatment facilities on the proposed Site would be blended with the CAP water before any application for irrigation purposes. Water applied for irrigation would have a resultant TDS similar to levels found in the groundwater. Amended Table 4-17 in Section 4.5 of the FEIS shows the comparison of the wastewater before and after blending and the groundwater.

Comment No. 22 (cont.) **Issue Code: 07**

Chloride levels in the blended wastewater would be approximately 300 mg/L. This would be below the current groundwater chloride levels of approximately 735 mg/L that have been applied to crops. The blended wastewater chloride level would be slightly above the Federal Secondary Maximum Contaminant Level of 250 mg/L for drinking water (40 CFR Part 143.3).

The blended wastewater that would be applied to adjacent crops represents a fraction of the irrigation water that would be applied to the crops. Since the TDS and chloride levels would be less than in the groundwater that historically has been applied to these crops, the probability of salinity buildup would be decreased. According to the landowner whose crops would be irrigated with the blended wastewater, a larger portion of the water for irrigation would be supplied by CAP water. Furthermore, flood irrigation would be applied periodically to these crops to leach salts from the soils. The blending procedures and the final water quality required for irrigation purposes would by law be in compliance with the Reclaimed Wastewater Reuse Permit issued and administered by the Arizona Department of Environmental Quality in accordance with the Arizona Administrative Code R18-9-701 through 707.

Comment No. 23 **Issue Code: 04**

Table 3-3 of the DEIS presents typical environmental noise for certain outdoor sound levels. This data do not represent conditions in the vicinity of the proposed Facility. The DEIS states on page 3-9, paragraph one, that the prevailing ambience in the vicinity of the proposed Facility is not 30-35 dBA. The results of a 24-hour noise survey conducted three-fourth mile from the proposed Facility is presented. The study, which was conducted in mid-December, indicated the average noise level is 45.2 dBA for this specific rural area, not the 30 dBA for a typical rural area.

Comment No. 23 (cont.) **Issue Code: 04**

Background noise was measured for a 24-hour noise period on December 14, 2000 near the proposed Site at the Randolph Road/Tweedy Road intersection. The average noise level during the 24-hour period from noon on December 14 to noon on December 15 was 45.2 dBA. The noise during daylight hours was 47.6 dBA, and at night was 41.3 dBA. The average daytime noise was about 45 dBA and the average nighttime noise was about 40 dBA. Had the noise survey been conducted at peak farming season, rather than mid-December, the results of the survey would likely have been higher than the average noise level of 45.2 dBA.

The expected noise level at the nearest residences from the proposed Facility would be 55 dBA, which is an increase of 10 dBA in the noise level from the average of 45.2 dBA. There would be a 14 dBA increase above the nighttime average of 41.3 dBA. This increase over a short period of time would fall between dramatic and striking. The DEIS states that "a qualitative assessment of dramatic and striking changes in sound level could be considered a significant impact." Therefore, for the nine residences that would experience between a 10 to 14 dBA increase in noise level from the startup of the turbines (i.e., those within approximately one mile of the facility), the noise impacts could be considered significant.

An additional consideration is that the turbines and generators would not start up instantly. Noise during a startup sequence would actually be less than during normal operations. The turbines start at low revolutions then speed up. The generators do not operate until the turbines are up to speed. This "spreads" out the startup noise over several minutes. The time period over which shutdown occurs depends on the nature of the shutdown. If all turbines and generators performed an emergency shutdown at the same time the cessation of noise would be dramatic.

Comment No. 23 (cont.) **Issue Code: 04**
Development of some of the nearby parcels of agricultural land into housing subdivisions would have several cumulative noise effects on the surrounding community. There would be more people nearby to experience the noise from the proposed Facility. The development would likely increase both the daytime and nighttime background noise levels whether or not the Facility is built. The increase in background noise would make the noise from the proposed Facility relatively less noticeable.

Comment No. 24 **Issue Code: 04**
The noise from startup and shutdown of the turbines and generators was discussed in Section 4.3 of the DEIS, and is addressed in the response to Comment No. 23 above. The nature of a peaking power plant does include more frequent startup and shutdown sequences than a base load power plant. However, the nature of electrical demand does not cause peaking power plants to startup and shutdown several times in a few hours. The number of turbines and generators that would be operating while the proposed Facility is operational may change fairly frequently; however, once one turbine/generator set is operating and producing noise, the startup or shutdown of other sets is less noticeable.

Comment No. 25 **Issue Code: 04**
See responses to Comment Nos. 23 and 24 above.

Comment No. 26 **Issue Code: 04**
Most predators, herptile, bird or mammal, in the desert hunt by scent and/or sight with some use of hearing. Those animals whose primary hunting technique include their auditory systems include bats and owls. Memphis State University (1971) found that bats are resistant to jamming. They tend to orient themselves so that noise and return signal are received from different angles. No studies were found on the masking properties of background noise on owls hunting ability, but personal observation on a barred owl (*Strix varia*) near an active

Comment No. 26 (cont.) **Issue Code: 04**
oil pumping site, and an eastern screech owl (*Otus asio*) in a suburban setting, found that they were successful for three years in a row in fledging at least two young per year. If background noise, either natural or man-made, adversely affects a predator, it has an equal effect on the prey.

Comment No. 27 **Issue Code: 04**
The DEIS considered the manufacturer's estimated noise effects (63 dBA at 400 feet) for each of the 12 LM6000 turbines. Noise propagation equations were used to predict the noise from each turbine at locations at the proposed Property boundary and beyond. The contribution from each turbine was then logrithmetically added to calculate the total noise at each location at the proposed Property boundary and beyond. Noise during a startup sequence would actually be less than during normal operations. This is because the generators are not yet operating during the startup sequence.

Comment No. 28 **Issue Code: 09**
The hedgehog cactus (*Echniocereus sp.*) referenced on page 3-37 of the DEIS is not the listed subspecies, Arizona hedgehog cactus (*Echinocereus triglochidiatus arizonicus*). The Arizona hedgehog cactus occurs at elevations of 3,700 to 5,000 feet. Elevations in the proposed Project area ranges from 1,415 to 1,437 feet, which makes the occurrence of the listed species unlikely.

Comment No. 29 **Issue Code: 14**
The commentor raises an important issue. Title VI complaints about the subject plants were filed with EPA. As of November 2000 (last update of status page), both of the Title VI complaints to the EPA were "Under Review" for possible investigation. This means that a complaint was received by the EPA, but no decision has yet been made on whether to reject the complaint because they did not meet regulatory requirements, accept the complaint for investigation, or refer the complaint to another Federal agency.

Comment No. 29 (cont) **Issue Code: 14**

The commentor's assertion that "all hazardous waste facilities in Phoenix that accept hazardous waste generated off-site are all in low-income communities of color" is not substantiated by any documentation. Hazardous waste would be disposed of in accordance with all applicable regulations. While the proposed Project has no role in the siting or operating of the hazardous waste management facilities, it would be generating some waste that could be disposed of in the subject facilities. No quantification of the impacts of these facilities on surrounding minority or low-income populations has been made, so no calculation of the increase in impacts due to waste from the proposed Project can be made. However, it is evident that any disproportionate impacts to any minority or low-income populations from those facilities would be connected to a degree to the waste originating at proposed Facility. Thus, the proposed Project would have some disproportionate impact to minority or low-income populations around the subject waste disposal facilities should waste from Sundance be disposed of at either of the subject facilities.

Comment No. 30 **Issue Code: 05**

The DEIS states that spills or leaks of hazardous fluids (e.g., fuel, lubricants, chemicals, etc.) could contaminate the groundwater and affect aquifer use. The extent of the impacts would be minimized by restricting the location of hazardous materials storage, and immediate cleanup of spills and leaks. The procedures used for storage are discussed in the DEIS. In addition, the DEIS discusses the proposed Project's collection of stormwater. See Section 3.5.1.2, page 3-20 of the DEIS.

During exploratory drilling on the proposed Property, a water bearing zone was found at a depth of 270 feet. As part of the design of the proposed Facility, drains would be installed near all equipment with any probability of oil or fuel leaks. All drains would flow to a

Comment No. 30 (cont.) **Issue Code: 05**
water/oil separator in the event of a spill. Concrete containment structures would be constructed at the perimeter of this equipment to handle any sheet flow overflows. Concrete foundations and embankments would be constructed around the ammonia and fuel tanks designed to handle any overflow of the maximum amount of ammonia or fuel stored onsite at any time.

Comment No. 31 **Issue Code: 09**
The assessment of visual resources is subjective. In order to increase the objectivity of these assessments, methods have been developed that include factors that can be measured. These factors include points of view, numbers of people using these points of view, and prevalence of the type of resource in the area. These factors are used to determine existing character of the resource, the potential changes to the resource, and the number of people that would be affected. It is true that someone living in close proximity to the proposed Facility would have his/her view impacted to a greater degree than the general public.

The DEIS readily discloses that the proposed Facility would be apparent to viewers within three miles of the proposed Facility and would change the characteristic landscape around the proposed Facility. While the plume may be visible during cold mornings, the hot and dry climate conditions in Coolidge would lead to rapid evaporation of the plume during most of the year. The proposed Facility would be a simple-cycle generating facility, not a combined-cycle facility with cooling towers, and would not produce a large steam plume.

Comment No. 32 **Issue Code: 09**
Typically, wildlife species will avoid lighted areas unless lights attract a prey. Nocturnal insectivorous birds and bats would be attracted to insects that would be attracted to the lights at the

Comment No. 32 (cont.) **Issue Code: 09**
proposed Facility. This would probably be a significant positive impact. Other less tolerant wildlife would avoid the proposed Project area.

Comment No. 33 **Issue Code: 11**
While consultations were ongoing, preliminary discussions indicated no immediate problems. The results of the consultations to date have been included in the FEIS.

Comment No. 34 **Issue Code: 15**
Asphalt roads have been constructed for many years in the USA. Any short-term inconvenience of smelling asphalt fumes is overridden by the long-term effect of reducing road dust by paving roads. Only a 1.5 mile stretch of road would be paved allowing for a very short construction period over which any asphalt fumes would be present.

Comment No. 35 **Issue Code: 13**
Section 3.11 in the DEIS discusses the labor force in the Region of Influence. The majority of the required labor force would be available in the Phoenix-Mesa area, which includes Pinal County and Coolidge. To the extent that some specialized skill classes are not available in the area, it is assumed that these workers would migrate to the area on a temporary basis during the construction phase. Very few if any out-of-state workers are expected. See response to Comment No. 37.

Comment No. 36 **Issue Code: 13**
The construction of the proposed Project is anticipated to take 12 months. A large part of the workforce is expected to commute from Phoenix either daily or weekly. Very few families are anticipated to move to the Coolidge area. Those few families that might move to the area would contribute the same to the local tax base as current local families that rent housing. See response to Comment No. 37.

Comment No. 37 **Issue Code: 13**

Personal property tax basis is assessed centrally by the Arizona Department of Revenues. As a Class 3 facility, Sundance would be assessed by ADOR in an equivalent manner with any other manufacturing facility in Arizona. The property tax rates are determined by Pinal County and apply to all personal property, with no special tax breaks granted to any individual facility. The current estimate of local taxes that would be paid by the proposed Project is discussed in Section 4.11 in the DEIS. The taxes are estimated to be approximately $2 million per year for this facility. It is difficult to relate taxes to other business liabilities. Due to the nature of tax assessment in Arizona, no negotiations or agreements have been initiated.

As discussed in Section 4.11.1 in the DEIS, the construction workforce is estimated to range between 60 and 330 workers. The DEIS projects that this workforce would come from the Phoenix-Mesa Metropolitan Statistical Area (MSA) which includes Pinal County and Coolidge. No out of state workers are anticipated. Coolidge is within commuting distance of Phoenix and minimal long-term housing of workers is anticipated. The benefit of the revenues to the local economy far exceeds the cost of services provided to a 12 month construction work force and 8 to 12 permanent operators.

Comment No. 38 **Issue Code: 13**

The 8 to 12 permanent full-time staff needed to operate the proposed Facility would include operational and maintenance staff. The required skills are within the capabilities of the Phoenix-Mesa MSA of which Pinal County and Coolidge are part. The impact of this small permanent workforce is not expected to perturb the Coolidge services, school system or tax base. Since the proposed Project is within commuting distance of Phoenix, it is likely that some of the permanent staff may not even reside locally. See response to Comment No. 37.

Comment No. 38 (cont.) **Issue Code: 13**
The DEIS was prepared by a contractor with direction and oversight by Western.

Comment No. 39 **Issue Code: 14**
The Environmental Justice section was prepared in accordance with Department of Energy and Council on Environmental Quality guidelines. These guidelines direct the comparison of minority and low-income populations of the affected area with that of the larger overall region. The demographic composition of the local affected area (Census Tract 12) is comparable to that of the region. There were no disproportionate concentrations of minority or low-income populations evident from the census data. The unavoidable adverse human health impacts identified in the DEIS included air emissions, noise, and visual impacts. These impacts were assessed and would not disproportionately affect minority or low-income populations.

Comment No. 40 **Issue Code: 24**
The American with Disabilities Act would be taken into account during the design and operation phases of the proposed Facility. The requirement to assess disproportionate adverse impacts is a requirement for Environmental Justice. Environmental Justice analyzes impacts to low-income and minority populations.

Don't Waste Arizona, Inc.
Phoenix, AZ
Page 1 of 2

May 2, 2001

John Holt, Environmental Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
Phoenix, AZ 85005-6457

Re: Additional Comments on Draft Environmental Impact Statement for Sundance Energy Project DOE/EIS - 0322

Dear Mr. Holt:

Don't Waste Arizona, Inc. (DWA), headquartered at 6205 South 12th Street, Phoenix, AZ 85040, and available by telephone at (602) 268-6110, supplements its first comments dated May 1, 2001, regarding the Draft Environmental Impact Statement for Sundance Energy Project DOE/EIS - 0322 with the following comments:

AIR QUALITY AND VISIBILITY ISSUES

The Clean Air Act requires Reasonable Progess Considerations regarding visibility in Class 1 areas for the future approval of State Implementation Plans (SIPs). The Sundance Energy Project will have, according to its air permit application materials filed with the Pinal County Air Quality Control District, an admitted effect on the Superstition Mountain Wilderness Area, which is a designated Class 1 area. Further, within the lifetime of the proposed Sundance facility, in the year 2008, there must be a Reasonable Progress Consideration for improving the visibility in the Superstition Mountain Wilderness Area that must be promulgated and prepared for the Arizona SIP. The statutory goal of the Reasonable Progress Consideration is to restore visibility in Class 1 areas throughout the United States to what it was before the Industrial Revolution by the year 2064.

There is, however, no mention in the DEIS about this issue, much less and examination of the impacts of the Sundance Energy project's operations and emissions upon this. The effect of the Sundance Energy Project upon the visibility within the Superstition Mountain Wilderness Area, for all years of operation, and the effect of the facility's operations on the attainment of the Reasonable Progess Considerations regarding visibility in Class 1 areas such as the Superstition Mountain Wilderness Area must be analyzed, modeled, quantified, and fully examined for the NEPA process regarding the Sundance Energy Project to be carried out according to federal NEPA statutes.

This examination should also include the impacts associated with noncompliance with the Reasonable Progess Considerations regarding visibility in Class 1 areas and its effect on the approval of the Arizona SIP (disapproval), and the effects and impacts of

01/03

Comment No. 01 **Issue Code: 03**

See the amended air quality analysis in Section 4.2 in the FEIS. Based on the updated emissions with the use of SCR, the proposed Facility would not have any adverse effect on Class I airsheds.

noncompliance in terms of federal sanctions, and those cumulative effects.

01/03 (cont.)

Sincerely,

Stephen M. Brittle

Stephen M. Brittle
President

Gila River Indian Community
Sacaton, AZ
Page 1 of 3

GILA RIVER INDIAN COMMUNITY

DEPARTMENT OF ENVIRONMENTAL QUALITY
Post Office Box 97
Sacaton, Arizona 85247
(520) 562-2234 • Fax: (520) 562-2245

May 4, 2001

John Holt
Western Area Power Administration
615 S. 43rd Avenue
Phoenix, AZ 85005

Mr. Holt,

The Gila River Indian Community Department of Environmental Quality (DEQ) has reviewed the Sundance Energy Project Environmental Impact Statement (EIS) and has the following comments:

- On page S-5, Table S-1 (Air Quality) The table indicates that "Maximum annual NOx and 24-hour PM_{10} concentrations are predicted to occur on the high terrain to the west and northwest of the proposed facility on the eastern ridges of the Sacaton Mountains". 01/10

  Since the Sacaton Mountains have cultural value to the members of the Gila River Indian Community, impacts to the mountains could be considered adverse by members of GRIC. This potential concern needs to be addressed in the EIS.

- Table S-1 states "The proposed facility would be a major PSD source for NOx and CO. For Configuration 1, the PSD class II increment consumption in significance area of proposed facility would be 21% of NO_2 PSD Class II increment of 25ug/m^3. 02/03

  This statement seems to indicate that this single, proposed facility will use up 21% of the Class II NO_2 increment in the significance area (Santan Mountains). This facility may adversely affect the quality of the air GRIC members breathe. This issue needs to be addressed in more detail in the EIS.

- Page 4-12, States "The result of modeling for criteria and hazardous pollutants indicate small incremental contributions to the existing air quality in the vicinity of the project. The maximum percent of a regulatory standard from proposed facility emissions is five percent for NO_2 for the annual averaging period. This impact occurs on the high terrain to the west and northwest if the proposed facility on the eastern ridges of the Sacaton Mountains". 03/03

Page 1 of 2

Comment No. 01 **Issue Code: 10**
See the amended air quality analysis in the Section 4.2 in the FEIS. Before the addition of the Selective Catalytic Reduction (SCR) air quality control technology, the average annual maximum NO_x concentration was 4.39 $\mu g/m^3$ with a predicted maximum of 5.08 $\mu g/m^3$. The average 24-hour maximum PM_{10} concentration was 2.37 $\mu g/m^3$ with a predicted maximum of 2.67 $\mu g/m^3$. With the SCR, the average annual maximum NO_x concentration was reduced to 1.11 $\mu g/m^3$ with a predicted maximum of 1.40 $\mu g/m^3$. However, the average maximum 24-hour PM_{10} concentration was increased to 3.76 $\mu g/m^3$ with a predicted maximum of 4.74 $\mu g/m^3$.

Comment No. 02 **Issue Code: 03**
The FEIS includes a new air quality analysis that takes into account the installation of SRC air pollution control technology to reduce NO_x emissions over those discussed in the DEIS. See the amended air quality analysis in Section 4.2 in the FEIS. The results of the analysis indicate that the maximum impact from all sources is predicted to increase to 1.47 $\mu g/m^3$ or 0.07 $\mu g/m^3$ higher than the 1.40 $\mu g/m^3$ modeled for the proposed Facility only. Therefore, the PSD Class II increment consumption would be 1.47 $\mu g/m^3$ or 5.9 percent of the available increment of 25 $\mu g/m^3$.

Comment No. 03 **Issue Code: 03**
Installation of the SRC air pollution control technology would result in an 80% reduction of NO_x emissions over those discussed in the DEIS. See the amended air quality analysis in Section 4.2 in the FEIS. The revised ambient air quality analysis indicates a maximum annual NO_x ambient air concentration of 1.40 $\mu g/m^3$ from the proposed Project which is 1.4% of the NO_x standard. This maximum concentration would occur in the Sacatan Mountains. When all NO_x sources

This statement suggests that only 5% of the regulatory standard is attributed to emissions from the facility. Table 4-11 indicates that the total concentration of NO_2 (background and facility emissions) are 64% of the NOx standard of 100ug/m^3. There seems to be some discrepancy between these numbers. In addition, Table 4-11 indicates that concentrations of background and facility emissions of PM_{10} combined will be 80.5% of the standard of 50ug/m^3 for the annual average. This seem extremely high to result in a finding of no impact. The method for obtaining modeling information, the method for determining percent of regulatory standard and the method for determining impact from the proposed facility is vague and hard to follow. This information needs to be clarified. 03/03 (cont.)

- Page 4-17, Conclusion: The last sentence states "Visibility impacts in the Class I airsheds would be mitigated by instituting operating limits during certain months of the year to reduce visibility extinction to less than five percent."

  Our understanding of rules regarding impact on Class I areas by proposed new Major Sources would prevent this facility from obtaining an air quality permit due to the extent of impact on visibility in the those areas. In addition, the EIS does not address the impact on visibility in the Santan Mountains. The EIS needs to address visibility impacts on the Santan Mountains. 04/11

Please respond to these comments in the Final EIS. If you need more information, please contact Daniel Blair, air quality specialist, at (520) 562-2234. Thank you.

Sincerely,

Patricia Mariella, Ph.D.
Director

cc: Donald R. Antone, Sr., Governor
Daniel Blair, DEQ

Page 2 of 2

Comment No. 03 (cont.) **Issue Code: 03**

were modeled with the proposed Facility, the maximum ambient NO_x concentration was 1.47 μg/m^3 or 1.47% of the standard (see discussion of PDS Analysis in amended Section 4.2 of the FEIS).

NO_x is not directly measured in Pinal County or the Sacatan Mountains. Therefore, there is no measurement of the background concentration of NO_x near the proposed Facility or near where the maximum annual NO_x concentration is expected to occur. The closest NO_x measurement was the maximum ambient air concentration of 58.5 μg/m^3 in Scottsdale which was used as an ultra-conservative estimate of the existing background ambient NO_x level for these two locations. When the maximum impacts from all sources were added to the assumed conservative background concentration, the resultant NO_x maximum concentration was 59.97 μg/m^3 or about 60% of the maximum allowable National Ambient Air Quality Standard (NAAQS). The maximum annual NO_x concentration due to the proposed Facility would be a 2.5% increase above the background concentration.

The revised ambient air quality analysis indicates a maximum annual PM_{10} ambient air concentration of 0.93 μg/m^3 from the proposed Project or 1.86% of the standard. This maximum would occur in the Sacatan Mountains. The annual background concentration of PM_{10} in the Coolidge area is 39.6 μg/m^3 or 79.2% of the standard. Together, the maximum annual PM_{10} concentration would be 40.53 μg/m^3 or 81% of the standard. The maximum annual PM_{10} concentration due to the proposed Facility would be a 2.3% increase over the background concentration.

The NAAQS for NO_x was established by the U.S. Congress as a level that would protect the public health and welfare with an adequate margin of safety. Sixty percent of this NAAQS still affords more than

Comment No. 03 (cont.) **Issue Code: 03**
adequate protection to public health and welfare. Likewise, the modeled annual PM_{10} ambient levels, at approximately 80% of the NAAQS, afford adequate protection for the public.

Comment No. 04 **Issue Code: 11**
See the air amended quality analysis in Section 4.2 in the FEIS. Based on the updated emissions with the use of SCR, the proposed Facility would not have any adverse effect on Class I airsheds.

Hohokam Irrigation & Drainage District
Coolidge, AZ
Page 1 of 1

HOHOKAM

The Power of Choice

April 11, 2001

Mr. John Holt, Environmental Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
Phoenix, Arizona 85005-6457

Re: Public Comment on Sundance Energy Project Draft EIS #0322

Dear Mr. Holt:

As the Manager of the Hohokam Irrigation & Drainage District and as a landowner and resident of Pinal County, I am familiar with the Sundance Energy Project proposed to be constructed South and West of Coolidge. I have also reviewed the Draft EIS for the project and have driven the proposed transmission alignment.

I agree with the conclusions of the Draft EIS that the proposed project will not have any significant environmental impact on the area.

Of the three alternative transmission routes, Alternative 3 is the most acceptable and will have the least amount of adverse impact on adjoining landowners. I would urge you to select this alternative as the "Preferred Alternative". In light of the current energy supply status, I would also urge you to expedite the Final EIS as much as possible.

Thank you for this opportunity to comment and you consideration of those comments received.

Respectfully,

Jack C. Long
Manager

HOHOKAM IRRIGATION & DRAINAGE DISTRICT
142 South Arizona Blvd., Coolidge, AZ 85228-4725
PHONE: (520) 723-7751 • FAX: (520) 723-4939 • E-MAIL: hohokam@c2i2.com

01/22 **Comment No. 1** **Issue Code: 22**
Comment noted.

02/17 **Comment No. 2** **Issue Code: 17**
The commentor's preference has been noted.

Larabell, Robert A.
Page 1 of 2

ROBERT A. LARABELL
Acoustical Consultant

Francis J. Slavin, P.C.
2198 East Camelback Road
Suite 285
Phoenix, Arizona 85016

RE: Sundance Energy Project draft EIS, March 2001

Dear Buzz:

Per your request, I have studied the subject document and I found three major noise impact premises which need to be questioned.

Ambient sound levels

On page 3-8, Table 3-3 lists comparative A-weighted sound levels for various outdoor ambiences, and these levels conform within a few decibels with acousticians' field readings. Note that a "quiet urban nighttime" is listed at 45 dBA, a "quiet suburban nighttime" is 40 dBA, and a "quiet rural nighttime" is shown at 30 dBA. The demographic descriptions and maps seem to be designate the quietest of these ambiences, but Section 4.3 of the Report assumes the louder existing ambiances. As stated at the bottom of page 4-18, "The determination as to whether an impact is significant with respect to noise is a qualitative assessment of the increase in noise level above background as experienced by those receptors." Certainly, if the prevailing ambience is in the 30-35 dBA area, as data in the Report clearly indicates, the changes in sound levels will be about 20 dBA, which the Report acknowledges to be "perceived as 'striking' ". Indeed, the data included in this Report acknowledges that the noise impact will be strongly significant.

01/04

02/04

Impact noise levels

The Report states (bottom p. 4-19) that the impact levels of the operating equipment is "predicted to not exceed a noise level of 55 dBA, about 2,500 feet from the Property boundary..". This rather glib disclaimer is not supported by any field test data, which a project of this scope and impact certainly seems to warrant. The assumption appears to be that steady-state optimal-efficiency operations prevail, neither of which conditions can be legitimately assumed. The Report needs to provide the complete acoustical signatures of the equipment, particularly since the unpredictable start-up times and noise levels could very well prove traumatic to the residents of the eleven houses within that proximity. If the precise noise impact levels can not be plotted, it is only reasonable that the project provide a noise attenuation stipulation wherein the equipment is warranted to produce noise levels no greater than an agreed-upon impact maximum.

03/04

04/04

Comment No. 01 **Issue Code: 04**

The expected noise level at the nearest residences from the proposed Facility is 55 dBA, which is an increase of 10 dBA from the average noise level of 45.2 measured in mid-December for this specific rural area. There would be an increase of 14 dBA above the nighttime average of 41.3 dBA. Also see response to Public Hearing Comment No. 31.

Comment No. 02 **Issue Code: 04**

See response to Comment No. 01 above.

Comment No. 03 **Issue Code: 04**

The DEIS considered the manufacturer's estimated noise effects (63 dBA at 400 feet) for each of the 12 LM6000 turbines. Noise propagation equations were used to predict the noise from each turbine at locations at the proposed Property boundary and beyond. The contribution from each turbine was then logarithmically added to calculate the total noise at each location at the proposed Property boundary and beyond. Noise during a startup sequence would actually be less than during normal operations. This is because the generators are not yet operating during the startup sequence. In addition, a turbine starts slowly at low revolutions, slowly accelerating up to speed.

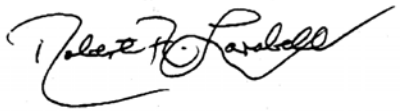
Comment No. 04 **Issue Code: 04**

The manufacturer's estimated noise effects for each of the 12 LM6000 turbines was used to calculate the total noise as indicated in response to Comment No. 03 above. A plot of the noise levels was provided in Section 4.3 of the DEIS.

ROBERT A. LARABELL
Acoustical Consultant

Impact damages
If the technical data voids as described above can not be accurately dispelled, it would seem equitable to provide legal terms by which the severely impacted neighbors are duly compensated for their loss of the existing pristine acoustical ambience. They will find little comfort in the disclaimer that "noise at this level is equivalent to a residential air conditioner at 50 feet" (top, p.4-20). In fact, not only initially but continually, when the equipment suddenly and without warning blasts on at its start-up level, the neighbors as well as their livestock will be jolted into the realization that their rural peace has been acoustically shattered. 05/04

Please call if you have any questions about this report or if I may serve you further.



Comment No. 05 **Issue Code: 04**

The DEIS report states on page 3-9, paragraph one, that the prevailing ambience in the vicinity of the proposed facility is not 30-35 dBA. The results of a 24-hour noise survey conducted three-fourth mile from the proposed Facility is presented. The study, which was conducted in mid-December, indicated an average noise level of 45.2 dBA for this specific rural area, not the 30dBA for a typical rural area.

Development of some of the nearby parcels of agricultural land into housing subdivisions would have several cumulative effects on noise. There would be more people nearby to experience noise from the proposed Facility. Development would likely increase both daytime and nighttime background noise levels whether or not the proposed Project is built. The increase in background noise would make the noise from the proposed Facility relatively less noticeable. Also see response to Public Hearing Comment No. 20.

Discussion of legal issues and compensation of affected residents are beyond the scope of the Sundance EIS.

REPORTER'S TRANSCRIPT OF PROCEEDINGS
DRAFT ENVIRONMENTAL IMPACT STATEMENT
SUNDANCE ENERGY PROJECT

Coolidge, Arizona
April 12, 2001

AHWATUKEE COURT REPORTING, INC.
P.O. Box 50571
Phoenix, Arizona 85076

PREPARED FOR:
John R. Holt
(Original)

PREPARED BY:
Katherine M. Hanchette
CCR No. 50472

Page 9

MR. BRITTLE: No. I'll probably sit right here.
MR. HARNESS: Help yourself.
MR. BRITTLE: That will work.
Okay. My name Stephen, S-t-e-p-h-e-n, Brittle, B-r-i-t-t-l-e. I am the president of Don't Waste Arizona, statewide nonprofit environmental organization. We are headquartered at 6205 South 12th Street, Phoenix, Arizona 85040, and may be reached at 602-268-6110.
The first observation is that the draft Environmental Impact Statement, which I will refer to from now on as the DEIS, is overwhelmingly rife with inconsistencies and contradictions. The DEIS does not properly examine and analyze the impacts and the alternatives. It ignores a host of federal requirements in the field of environmental regulation. It appears to have been written deliberately to not examine or analyze properly the negative impacts of the proposed action, as it fails to really examine the environmental injustices and impacts the proposed facility will create, the adverse health impacts caused by the project, and other quantifiable adverse impacts caused by the facility's operations, such as

01/25

02/19

Comment No. 01 **Issue Code: 25**

The commentor's opposition to the proposed Project, and therefore, the EIS is noted. The commentor's overall judgement of the DEIS is based on the sum of his individual comments that are detailed below. Those individual comments, which include examination of alternatives, NEPA and Federal requirements, inconsistencies and contradictions are addressed individually.

Part of the commentor's general and detailed comments stem from the DEIS not describing or evaluating the impacts from new air quality control system. The new air quality control system was mandated by the Pinal County Air Quality Control District after the DEIS was printed and distributed. The evaluation of the new system is included in the amended Section 4.2 of the FEIS.

Comment No. 02 **Issue Code: 19**

The DEIS does examine the negative impacts of the proposed action except those associated with the new air quality control system. These impacts are described in the amended Section 4.2 in the FEIS. See response to Comment No. 01 above. See also responses to Comment Nos. 20, 21, and 23 below for discussion of noise and Comment No. 25 on environmental justice.

Page 10

noise. 01/25 (cont.)

The DEIS instead of actually examining the impacts and conducting the analysis of the impacts and an examination of the alternatives, which are required by NEPA, gives many issues honorable mention; that is, it attempts to merely mention issues and then dismiss them as insignificant without any scientific or logical explanation of how or why these characterizations are made about the significance of the issues. It doesn't give proper discussion or analysis required by NEPA. Mere mention of an issue or an impact is not sufficient alone to service the analysis and expiration of alternatives that are at the heart of and statutorily required by NEPA. 01/25 (cont.)

A part of the record that I'd like to mention that Don't Waste Arizona has been involved in NEPA litigation in the past on precisely these kinds of issues.

Regarding air quality and health issues, I will have two exhibits to submit. The DEIS does not examine any alternatives to the Sundance facility's proposed simple-cycle, natural gas electrical power generation. 03/25

It doesn't examine the air pollution control technologies available 04/03

Comment No. 03 **Issue Code: 25**

Sundance Energy LLC (Sundance) has applied to the Western Area Power Administration (Western) for an interconnection to Western's transmission lines in the vicinity of Coolidge, Arizona in Pinal County, southwest of Phoenix. The Federal decision is whether to enter into an interconnection and construction agreement with Sundance for the requested interconnection. The only alternatives to this Federal decision is not to allow the interconnection or to allow a different interconnection (different routing).

The decisions associated with siting, design, construction, and operation of the proposed Facility are not Federal decisions. These decisions are regulated, approved, and overseen by the State of Arizona. Therefore, different sites, designs, and operational factors are not alternatives to the Federal decision. However, the impacts resulting from these decisions are interconnected with the decision to allow interconnection. If no interconnection is allowed, the proposed Facility would not be built. Therefore, the potential impacts from the siting, design, construction and operation of the proposed Facility are connected to the Federal interconnection decision. This EIS examines the impacts of the interconnected actions, even those actions that are not Federal decisions.

Comment No. 04 **Issue Code: 03**

The decision as to which air pollution control technology to implement at the proposed Facility is up to the Sundance and the appropriate State and/or local regulatory agencies. It is not Western's decision. However, the impacts associated with the outcome of that decision are discussed in this EIS. It is the charter of the air quality regulatory agency to analyze the applicant's permit requests, and regulate the manner in which a project may operate with respect to air quality laws and regulations.

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or that will actually be used. It does not also provide any credible analysis of the impacts caused by Title V, major source of pollution being put into the air and of the area. 04/03 (cont.)

The DEIS admits the facility's impacts on air pollution has triggered the prevention of significant deterioration, or PSD, analysis requirements with quantifiable impacts 50 kilometers away from the plant's site, then cavalierly shrugs off these impacts as insignificant. This alone is disingenuous. Of the thousands of facilities in America that must get air pollution permits, a tiny fraction trigger these PSD requirements, so it must be admitted in a federal regulatory overview that a facility required to conduct a PSD analysis is by definition a significant impact. 05/03

Outrageously on Page 2-41, the DEIS reports that there will be minimal impacts to air quality due to the construction and operation of the proposed facility. Don't Waste Arizona would dispute that assertion. 06/03

The DEIS does not adequately control the alternative control technologies for the Sundance facility. Long after the work on the DEIS was 07/03

Comment No. 04 (cont.) **Issue Code: 03**

In conjunction with the Sundance Energy DEIS, a PSD air permit application was submitted to the Pinal County Air Quality Control District (PCAQCD), the regulatory agency charged with administering air quality laws and regulations in Pinal County. As part of the PSD application, an analysis of control technologies was presented and evaluated. A draft permit and associated technical support document were issued for public review April 27, 2001. These public documents may be examined by contacting the PCAQCD.

Comment No. 05 **Issue Code: 03**

A PSD New Source Review is triggered if estimated emissions of any of the criteria pollutants exceed 250 tons per year. Key components of the PSD review are a determination of Best Available Control Technology and an analysis of ambient air impacts. If the ambient air impacts exceed the EPA's "significance criteria", then a cumulative air quality analysis is completed to ensure that the PSD Class II incremental increases are not exceeded. However, in no case may the facility's emissions cause an exceedance of the National Ambient Air Quality Standards (NAAQS) established by the Clean Air Act. The analysis for the proposed Facility indicated that the maximum ambient air impact for all pollutants, and applicable averaging periods, were less than 4% of the NAAQS. These maximum impacts were on the top of a ridge approximately seven miles west/northwest of the proposed Facility. In Coolidge, as well as at the locations of residences within five miles of the proposed Facility, the maximum impacts were less than one percent of the NAAQS.

Comment No. 06 **Issue Code: 03**

See response to Comment No. 05 above.

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largely completed, the Pinal County agency that will ultimately issue the air pollution permit notified Sundance that it would require Sundance to utilize a control technology called selective catalytic reduction, or SCR. SCR entails injecting ammonia into the exhaust across a catalyst bed causing a reduction reaction that greatly eliminates and thereby controls NOx. With SCR, NOx can be reduced tenfold from previously achievable levels to about two-and-a-half parts per million per unit fuel.

The agencies that issue air permits are rather myopic about reducing what they call criteria pollutants, carbon monoxide, VOCs, NOx, SOx, particulate matter at 10 microns or less in size, called PM10, and ignore the other impacts in their consideration. The risk from NOx emissions may be traded for the risk from ammonium sulfate, and the public may be getting more risk from the ammonium sulfate. It's a real concern to my organization.

The SCR technology requires excess ammonia to be injected into the exhaust stream so that there will be enough to react, but the excess ammonia combines with sulfates in the air above

07/03 (cont.)

Comment No. 07 **Issue Code: 03**

The new air quality control system was mandated by the Pinal County Air Quality Control District after the DEIS was printed and distributed. The FEIS includes the evaluation of the new system. See the amended air quality analysis in Section 4.2 in the FEIS that incorporates the use of SCR to reduce NO_x emissions by 80%.

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pollution levels commonly found in U.S. cities. A German study, Environmental Air Pollution and Lung Disease in Children, states: Sulfates will increase the use of medication and decrease lung function in asthmatic children.

The DEIS is particularly unscientific in this regard.

Would I just give these to you at the end?

MR. HARNESS: Yes.

MR. BRITTLE: Table 3-2 on Page 3-7 shows the 24-hour maximum ambient air concentrations of PM10 in Coolidge as 83.6 micrograms per cubic meter. With the NAAQS standard, the National Ambient Air Quality Standard, at 150 micrograms per cubic meter shows the ambient -- annual ambient air concentration of PM10 in Coolidge at 39.6 micrograms per cubic meter with the national standard at 50 micrograms per cubic meter. This is without the additional burden of the PM10 that will be emanating from the Sundance facility. And this is a facility that will emit so much PM10 that it requires a PSD analysis. So it will certainly and undoubtedly move the ambient air concentrations of PM10

08/03

Comment No. 08 **Issue Code: 03**

See the amended air quality analysis in Section 4.2 in the FEIS. The NAAQS for the annual PM_{10} concentration is 50 $\mu g/m^3$. The annual average PM_{10} ambient levels in Coolidge have been recorded as 39.6 $\mu g/m^3$ or 79% of the NAAQS. The maximum impact analyzed for the annual PM_{10} from the proposed Facility was 0.93 $\mu g/m^3$ or 0.19% of the NAAQS, a 2.4 percent increase over the measured background level. When Sundance's maximum impact is added to the background, the total is 40.53 $\mu g/m^3$, or 81% of the NAAQS. The NAAQS were established by the Clean Air Act to protect the public health and welfare with an adequate margin of safety. A level of 80% of the NAAQS provides the protection mandated by the Clean Air Act.

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upwards and closer to the limits of the national standards.

There obviously will be an impact on health. And the DEIS never deals with this obvious information. And the impacts of additional PM10 must be fully quantified, analyzed, and addressed before this would meet the requirements of NEPA. Again, we reference the December 14 study. In this study, the investigators use a single, analytic approach to examine the association between PM10 concentrations in a given 24-hour period and the number of deaths reported on the following day in 20 of the largest cities in metropolitan areas of the United States including Phoenix, Arizona. The average found that an average increase in the rate of death from all causes of about .5 percent for every increase of the PM10 concentration of 10 micrograms per cubic meter.

The PM10 concentrations were positively associated with the daily mortality rates in most of the 20 cities studied and at concentrations well below the current 24-hour standard of 150 micrograms per cubic meter. In fact, the 90th percentile of distribution of daily values is

08/03
(cont.)

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below the 24-hour standard in each of the 20 cities. In other words, the standards are already at a lethal point. Moreover, the association was specific to PM10. The finding of a strong association between the PM10 concentration and the rate of death from cardiovascular or respiratory causes offer support for the idea that concentrations of particulate air pollution influenced mortality.

After reviewing the science, anyone who would claim that the Sundance Energy Facility would create minimal impacts is totally irresponsible. It is also with complete scientific basis to say that more asthma and other respiratory diseases will be caused or aggravated by this major pollution source. Of course, that is not addressed at all in this DEIS. 08/03 (cont.)

Further, the fact that the SCONOX technology, which is also considered the best available control technology by EPA Region 9, is not at all considered or evaluated as an alternative to this SCR technology, and that belies the deficiency of this DEIS. SCONOX, as it is known as an acronym, if used at Sundance and not the SCR technology that it currently proposes 09/03

Comment No. 09 **Issue Code: 03**

See response to Comment No. 04 above. The application of SCONOx was evaluated in the Best Available Control Technology of the PSD permit application submitted to the Pinal County Air Quality Control District. SCONOx was rejected for the proposed Facility because it is not technically feasible for simple cycle turbines because their exhaust temperature is higher than the optimal operating temperature range of SCONOx.

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and it isn't explored by the DEIS, would eliminate the ammonium, eliminate the ammonium sulfates, the inherent risk of storage and transportation of the ammonium, and would actually control the emissions of certain criteria air pollutants better than the SCR technology. We could avoid all of this.

On Page 4-10 in the discussion of hazardous air pollutants, the potential ambient air impacts were voluntarily evaluated using the Arizona Ambient Air Quality Guidelines, AAAQG, as a criteria to evaluate potential health risk, with the assertion that if the, quote, predicted concentrations are below the AAAQG, then it can be concluded that no health risk results. The AAAQG and the methodology used to produce them have never been peer reviewed and represent an entirely unproved standard.

Neither the AAAQG nor the DEIS in any way consider or evaluate the synergistic or cumulative effect of these hazardous air pollutants, the criteria pollutants that this Title V major source will emit, or the aforementioned ammonium sulfates. Yet, NEPA specifically requires an examination of the cumulative effects of the proposed significant

10/03

11/25

Comment No. 10 **Issue Code: 03**

The AAAQGs were developed by the Arizona Department of Health as health-based guidelines for contaminants in air. AAAQGs are residential screening values that are protective of human health including children. The AAAQGs are used as tools to decide which air emissions are at a level that they should be evaluated further. Chemical concentrations in air that exceed AAAQGs may not necessarily represent a health risk, but further modeling or calculation is required to assess whether there is a true threat to human health.

While the AAAQGs are not peer reviewed in the way a scientific paper is, they were derived from occupational exposure limits established or recommended by the U.S. Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety and Health (NIOSH), and the National Institute for Environmental Health Science (NIESH). The most protective standards or recommended levels from the U.S. and other countries were used. Many of these standards have undergone peer review as well as regulatory and legislative review.

See the amended air quality analysis in Section 4.2 in the FEIS. Hazardous air pollutants were evaluated against the AAAQG and all impacts except the annual averaged formaldehyde are predicted to be less than 1% of the AAAQGs. The annual formaldehyde value was 7% of the AAAQG. The adequacy of standards that have been implemented by Federal, State, and local agencies are beyond the scope of this NEPA process.

Comment No. 11 **Issue Code: 25**

The cumulative effects of air pollutants for the entire Phoenix area are discussed in the FEIS. The synergistic effects of combinations of chemicals are only beginning to be explored. There are very few human studies on multiple pollutant exposure. Studies to date have

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federal action. So this DEIS is invalid entirely in these respects and must be undertaken again with a closer eye on the statutory requirements. 11/25

As if that wasn't enough, there is the issue of the ammonia stored on-site at the power plant and the additional risks the ammonia presents. It will be common to see 15,000- to 20,000-gallon tanks of ammonia stored at power plants in Arizona. Most of them will probably use aqueous ammonia which is less risky than anhydrous. A catastrophic release of ammonia from a 15,000- to 20,000-gallon tank would be enough to kill and injure people at least a mile away depending on weather conditions. 12/15

The facilities with this much ammonia on-site have to report and participate in a federal program, either the 112R of the Clean Air Act, also called the Risk Management Program, if the ammonia on-site is at 20 percent or greater concentration. Otherwise, the facility will have to file Tier Two reports as required by the federal emergency planning and community right-to-know act. Either way they will have to develop a facility emergency plan that includes methods of notifying the public and the response

Comment No. 11 (cont.) **Issue Code: 25**

shown that there are possible additive or synergistic effects when ozone combines with sulfur dioxide, nitrogen dioxide, carbon monoxide, sulfuric acid, or other particulate aerosols. These synergistic effects can include greater decreases in lung function for some people concurrently exposed to ozone and other pollutants than for either pollutant alone. Exercise, smoking status, and existing pulmonary disease can also result in increased sensitivity to individual pollutants.

The DEIS was issued before the Pinal County Air Quality Control District decided that the proposed Project should use the SCR for addressing ammonia sulfates emissions. The FEIS discusses the impacts associated with the use of this air quality control method at the proposed Facility in the amended air quality analysis in the Section 4.2 in the FEIS.

The ambient air impacts analyzed for Hazardous Air Pollutants (HAPS) were far below the AAAAGs established to protect public health. The combination of miniscule ambient air impacts from the Sundance Facility and no other significant sources of HAPS nearby would result in a meaningless analysis.

Comment No. 12 **Issue Code: 15**

The proposed Facility would have the capacity to store up to 30,000 gallons of aqueous ammonia for injection into the SCR air pollution control system. The aqueous ammonia solution, less than 20% ammonia and more than 80% water, would be stored in two 15,000-gallon tanks on the proposed Site. Upon arrival at the Site, ammonia would be pumped into one of the two ammonia storage tanks (see Figure 2-1, Proposed Facility Configuration). A concrete containment area would be constructed around the tanks with sufficient volume to handle the discharge of one 15,000-gallon tank.

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agency that a release has occurred.
For a perspective, there are less than 18,000 RMP facilities in the entire nation that are reporting to the United States Protection Agency -- or Environment Protection Agency.
In rural areas, particularly here in Pinal County, such as where this Sundance facility site is, there are not sufficient resources to respond quickly enough to prevent deaths and injuries in the case of a catastrophic release. Responders in Pinal County simply do not have the equipment and infrastructure. Pinal County relies on other counties' response for these kinds of large types of HAZMAT response.
If there had been a responsible environmental impact study process conducted here, it would have included an interview with the Pinal County Local Emergency Planning Committee. They will tell you, and very happily tell you, they do not have the resources to respond in this kind of event. People could shelter from the ammonia, but it will infiltrate their homes within a given amount of time, reach harmful, even lethal concentrations before responders could arrive. When the release occurs, unless a rescuer arrives

13/15

12/15 (cont.)

Comment No. 12 (cont.) **Issue Code: 15**

After the ammonia hose is connected from the truck to the tank, a second vapor recovery hose would be connected from the top of the tank back to the truck to contain any residual vapors that may be in the ammonia tank. In the unlikely event of spills during the delivery of ammonia or during operations, water hoses would be immediately available to dilute the spilled ammonia within the containment area. Operation of the SCR would not involve any high pressure release of ammonia vapor. The aqueous ammonia would be pumped from the storage tanks to the SCR reactor chamber in liquid form. The ammonia would then heated sufficiently for vaporization, and injected into the SCR for mixture with the exhaust stream.

Comment No. 13 **Issue Code: 15**

NEPA guidelines do not specifically require an assessment of emergency response capabilities, and the assessment of potential impacts of accidents does not usually take into account any emergency response. The impacts of accidents to the general public are assessed as if no mitigation would occur. It is often assumed that a person with no protection is located in the worst place for 24 hours a day, 365 days a year. Impacts to the general public are usually assessed using maps of entire populations in the area. No evacuations are assumed. Any emergency response plans or evacuation capabilities are usually discussed in terms of mitigation of the potential impacts of an accident. Since the SCR air quality control method has been designated by the Pinal County Air Quality Control District, an assessment of potential accidents associated with the storage and transportation of ammonia has been included in the FEIS.

The proposed Facility would rely on both onsite fire and local fire protection services. Raw water storage tanks would be the source of water for fire suppression. An emergency diesel-fueled- fire pump

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in a timely manner, brings self-contained breathing apparatus for each individual, there will be fatalities and permanent injuries. 12/15 (cont.)

There may also be issues of evacuation routes sufficient to allow timely evacuation. Both rural and urban areas will see a heightened risk along the transportation route of the ammonia because a tanker of ammonia can rupture just like any other kind of tanker. And again, there is no responsibility in this county to those kinds of problems. None of these issues are examined at all, yet all are federal environmental regulations. 14/12

Glaring error in the DEIS. The failure to discuss the control technologies is another one. 15/03

There are other strange things in this DEIS. On Page 2.5 there is a statement under optimal ambient conditions with the air temperature near 20 degrees Fahrenheit, Configuration 2 could generate about 647 megawatts. This is Coolidge, Arizona area. It's almost impossible and highly unlikely that this climatic condition would ever occur in this area, especially when the average minimum temperatures are revealed on Page 3.5. It's far more likely 16/03

Comment No. 13 (cont.) **Issue Code: 15**
would enable pumping of storage water to any potential fires for initial suppression of fire. For large fires, response would be from either the Arizona City Fire District, headquartered south of Casa Grande approximately 15 miles south of the proposed Facility, and the Apache Junction Fire District, headquartered approximately 20 miles north of the proposed Facility. Municipal fire departments are also in Casa Grande, and Florence, both within 10 miles of the proposed Facility. The Gila River Emergency Medical Service respond to hazardous materials spill incidents and emergency medical services. The Casa Grande Regional Medical Center provides 24-hour medical emergency service with a staff of 82 medical people.

Comment No. 14 **Issue Code: 12**
Since the SCR air quality control method has been designated by the Pinal County Air Quality Control District, an assessment of potential accidents associated with the storage and transportation of ammonia has been included in the FEIS.

Comment No. 15 **Issue Code: 03**
See response to Comment No. 04 above.

Comment No. 16 **Issue Code: 03**
See the amended air quality analysis in Section 4.2 in the FEIS. The referenced discussion indicates that 20 degrees Fahrenheit is the optimal temperature to get the maximum output from the turbines. This temperature is not expected. Therefore, the nominal output is 600 megawatts or less at expected temperatures. NEPA documents are expected to discuss the capability of the systems being analyzed.

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that temperature would be closer to 100 degrees Fahrenheit. This points out some of the disingenuity of this DEIS. It should have been focusing on reality and the required analysis and examination of alternatives and cumulative effects that NEPA requires.

The discussion on 2-7 regarding the generating facility is outdated, clearly shows that the design of the power plant is different now than what the DEIS states it to be. For example, the 6500 hours of operation is not at all correct. The facility will get an air permit allowing 8,760 hours of operation, which is in essence 24 hours, seven days a week.

Water issues. The discussion about water use, and starts on 2.9, does not fully examine the impacts of where the water will come from. To fully examine this, the actual source of the water, CAP water or groundwater, needs to be stated. The CAP water will come from the Gila River Indian community or the San Carlos Apache tribe, then the DEIS must examine the impacts of this on those tribal entities. If it will be from a groundwater pumping, then the assertions made in the DEIS are questionable at a minimum.

16/03 (cont.)

17/03

18/07

Comment No. 17 **Issue Code: 03**

The air permit requires a conservative calculation of the potential air pollution of the proposed Facility. Initially the preliminary air permit calculations used the conservative estimate of 8,760 hours. The amended air permit calculation now uses a conservative estimate of 7,500 hours. The proposed Facility is a peaking Facility. It would not be economical to run all of the time. The 6,500 hours of operation is the expected annual maximum for operation and is the estimate used for calculating water consumption and other impacts. See the updated air quality analysis in the amended Section 4.2 in the FEIS that reflects the operating conditions listed in the draft air permit issued for public comment.

Comment No. 18 **Issue Code: 07**

The source of CAP water would be a contract for excess CAP water delivery between Sundance and Central Arizona Water Conservation District (CAWCD). The contract has been pre-approved by CAWCD's Board of Directors and was offered to Sundance on January 12, 2001. Its execution is pending completion of a wheeling agreement between Sundance and Hohokam Irrigation District (HID) to transport the water from CAWCD's main canal through Hohokam's existing canals to the proposed Facility. The existing canal adjacent to the proposed Site has significant excess capacity beyond the needs of the proposed Project without upgrade or modification requirements. Wheeling service by HID has been assured by its manager and board members. The wheeling contract currently is in negotiation and drafting stage and must be executed before CAWCD will execute the offered CAP Excess Water contract. CAP water for the proposed Project would not come from Indian communities or tribes.

Sundance is considering, and is in preliminary negotiations concerning, the possible provision of CAP water from parties who hold existing long-term, firm subcontracts from CAWCD for very

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On 4-31, the DEIS states that subsidence from dewatering has occurred within the basin, but that the groundwater pumping that might result from the operations of the proposed Sundance facility is not expected to cause subsidence in the area of the Sundance facility. That is also disingenuous.

19/07

The DEIS provides no substantiation for that conclusion. And besides, if subsidence within the basin is already occurring due to groundwater pumping, it is obvious that pumping more groundwater from the same aquifer will result in subsidence somewhere in the basin. The analysis ignores this obvious conclusion, trying to divert attention to the subsidence impact by making the unsubstantiated remarks.

Noise. There are discussions about the noise impacts in different parts of the DEIS. And again, there are contradictions and logic laws illustrated in the handling of this. The DEIS states that the ambient background noise level of the proposed site is about 40 to 45 dBA and that the additional noise from the power plant at startup and shutdown would be an additional 10 dBA, which puts the noise level up about 55 dBA,

20/04

Comment No. 18 (cont.) **Issue Code: 07**

substantial amounts of water not currently utilized or anticipated by those parties to be fully utilized during the life of the proposed Project. Subcontractors include several Indian tribes or communities. No such commitment or arrangement has been discussed by Sundance with any Indian CAP allotee.

The worst case scenario, a hypothetical assumption that no CAP water being delivered to the proposed Facility, would require complete reliance on existing or new groundwater wells on the proposed Property. This worst case hypothetical scenario has been analyzed by independent professional hydrologists and by the Arizona Department of Water Resources (ADWR.) They have also analyzed the impact of the normal case scenario of projected emergency backup reliance on groundwater during anticipated short-term unplanned and planned outages of the CAP delivery system. See *Memorandum* dated November 30, 2000 and supplemental *Memorandum* dated March 15, 2001, by Greg Wallace, ADWR Chief Hydrologist. ADWR has determined that under either scenario (intermittent backup use of groundwater or full reliance on groundwater for the life of the proposed Facility), the impact on the local groundwater table and groundwater rights and uses by surrounding landowners would be minimal and consistent with the Pinal Active Management Area Management Plans.

Since the proposed Facility would be a simple cycle facility with no cooling towers, there would be no impact to groundwater because of the relatively small water requirement from a very large regional aquifer. ADWR, in its November 30, 2000 memorandum, notes the dramatic rise in the local water table in recent years as follows: *"Since the mid-1980s, water levels in the area around the proposed plant site have risen by as much as 120 feet."* Groundwater use by the proposed Project, under a worst case hypothetical scenario, is

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which is the noise level of a commercial area, according to the DEIS.

Well, that noise level would certainly destroy the rural nature and atmosphere for the people living near this plant. And that's a real quality of life issue. One wonders why they live in the country to hear jet noises. 20/04 (cont.)

Further, the DEIS states on 4-18 the changes in sound levels of plus or minus dBA within the short timespan may be perceived as dramatic. DEIS is all words. But the DEIS also purports that, quote, normal operation excludes intermittent activities such as startup, shutdown, and any emergency or upset conditions. Now, this is really disingenuous because this is a peaking power plant. This is starting to start up and shutdown very often. To exclude startup and shutdown from normal operations is a fundamental and inappropriate contradiction to the logic, and the DEIS needs to take this into account. 21/04

The real story here is that local area residents, which are a low-income, ethnic minority community, will admittedly get dramatic noise disturbances at least daily and then more likely many times a day. And that makes the additional 22/04

Comment No. 18 (cont.) **Issue Code: 07**
anticipated to only slightly decrease the rate of the water table recovery.

Comment No. 19 **Issue Code: 07**
See response to Comment No. 18 above. Regional subsidence is an *historical* phenomenon not common to all lands or soils in the region, but nonetheless extensive in some locations in Pinal County. Historically, subsidence has been the result of severe groundwater overdrafting. However, in the last two decades, dramatic reversals of overdrafting conditions in the region (see ADWR memorandum cited in Comment No. 18) which confirms a substantial rise in local water table. As discussed in the DEIS, subsidence caused by historical groundwater pumping would not be further impacted by the proposed Project. ADWR has confirmed that the minor amount of water required by the proposed Facility, in the context of a rapidly rising water table in a very large aquifer, would have minimal impacts of only a slight decrease in those recovery rates.

The proposed Project's plan is to use groundwater for backup only. This would significantly *decrease* the amount of groundwater use at the Sundance irrigated property compared to historical and recent irrigation pumping of groundwater. Therefore, the proposedProject would decrease any risk of subsidence due to historical groundwater pumping.

Comment No. 20 **Issue Code: 04**
Table 3-3 of the DEIS presents typical environmental noise for certain outdoor sound levels. This data do not represent conditions in the vicinity of the proposed Facility. The DEIS states on page 3-9, paragraph one, that the prevailing ambience in the vicinity of the proposed Facility is not 30-35 dBA. The results of a 24-hour noise survey conducted three-fourth mile from the proposed Facility is presented. The study, which was conducted in mid-December,

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noise a very significant impact.
If this were to be a power plant that operated continuously, by contrast, a baseline power plant, then the human ear will get used to the noise and tune it out. But that's not the case here at all. People who live there will get the noise of a suburban setting foisted upon them in a dramatic manner and not the noise level of the rural setting that they currently enjoy. 22/04 (cont.)
Desert animals will also be affected by the noise. Predators, which use sound to track their prey, will be unable to hear the prey when the power plant starts up or shuts down and creates one of those dramatic sound events. 23/04
There are issues about how this DEIS handled the Endangered Species Act. Desert plants and endangered species are not adequately or even scientifically examined in this document. It acknowledges that hedgehog cactus is an endangered species and that hedgehog cactus occurs on the proposed site and along the proposed pipeline, Page 3-37. 24/09
Later on Page 4-40, the DEIS has the unfounded audacity to proclaim, quote, no highly safeguarded cacti were observed in the proposed

Comment No. 20 (cont.) **Issue Code: 04**

indicated the average noise level is 45.2 dBA for this specific rural area, not the 30 dBA for a typical rural area.

Background noise was measured for a 24-hour noise period on December 14, 2000 near the proposed Site at the Randolph Road/Tweedy Road intersection. The average noise level during the 24-hour period from noon on December 14 to noon on December 15 was 45.2 dBA. The noise at during daylight hours was 47.6 dBA, and nighttime noise was 41.3 dBA. The average daytime noise was 45 dBA and the average nighttime noise was about 40 dBA. Had the noise survey been conducted at peak farming season, rather than mid-December, the results of the survey would likely have been higher than the 45.2 dBA.

The expected noise level at the nearest residences from the proposed Facility is 55 dBA, which is an increase of 10 dBA in the noise level from the average of 45.2 dBA. There would be an increase of 14 dBA above the nighttime average of 41.3 dBA. This increase over a short period of time would fall between dramatic and striking. The DEIS states that "a qualitative assessment of dramatic and striking changes in sound level could be considered a significant impact." Therefore, for the nine residences that would experience between a 10 to 14 dBA increase in noise level from the startup of the turbines (i.e. those within approximately one mile of the facility), the noise impacts could be considered significant.

An additional consideration is that the turbines and generators would not start up instantly. Noise during a startup sequence would actually be less than during normal operations. The turbines start at low revolutions then speed up. The generators do not operate until the turbines are up to speed. This "spreads" out the startup noise

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project area. That's one of those many contradictions that the DEIS is rife with and kind of a disturbing pattern actually. 24/09 (cont.)

It brings up the issues of hazardous waste which also brings up the issue of environmental justice. Page 4-23, the DEIS states the project would dispose of hazardous materials at a hazardous waste facility either in Coolidge or another location in Phoenix. This ignores some real important facts. 25/14

There is an environmental justice complaint, a civil rights complaint that has been filed with the United States Environmental Protection Agency regarding the siting and permitting of the Heritage Hazardous Waste Facility near Coolidge -- that's the one that the DEIS refers to -- as well as the civil rights claim, the same kind of claim filed with USEPA regarding the proposed permitting of the innovative waste utilization hazardous waste facility in Phoenix.

All of the hazardous waste facilities in Phoenix that accept hazardous waste generated off-site are all in low-income communities of color, which raises civil rights issues and

Comment No. 20 (cont.) **Issue Code: 04**

over several minutes. The time period over which shutdown occurs depends on the nature of the shutdown. If all turbines and generators performed an emergency shutdown at the same time the cessation of noise would be dramatic.

Development of some of the nearby parcels of agricultural land into housing subdivisions would have several cumulative effects on noise in the surrounding community. There would be more people nearby to experience any noise from the proposed Facility. The development would likely increase both the daytime and nighttime background noise levels whether or not the proposed Facility is built. The increase in background noise would make the noise from the proposed Facility relatively less noticeable.

Comment No. 21 **Issue Code: 04**

The noise from startup and shutdown of the turbines and generators was discussed in Section 4.3 of the DEIS and in the response to Comment No. 20 above. The nature of a peaking power plant does include more frequent startup and shutdown sequences than a base load power plant. However, the nature of electrical demand does not cause peaking power plants to startup and shutdown several times in a few hours. The number of turbines and generators that are operating while the proposed Facility is operational may change fairly frequently; however, once one turbine/generator set is operating and producing noise, the startup or shutdown of other sets is less noticeable.

Comment No. 22 **Issue Code: 04**

See responses to Comments No. 20 and 21.

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environmental justice issues. That the DEIS does not investigate these issues puts it on track to violate the federal Civil Rights Act and related laws and it also constitutes a violation of NEPA requirements that they examine environmental justice. The impacts from spills of hazardous fluids are not addressed. Instead, the DEIS, in essence, reports that there won't be any, which is entirely unrealistic and certainly an unsubstantiated assurance. There would be -- there could be a very significant impact to the groundwater from a spill of hazardous fluids as the groundwater is only 75 feet below the surface. An unrealistic review -- or a realistic review of the impacts of a spill must be undertaken to comply with NEPA.

Visual resources. The discussion of visual resources that begins on Page 4-49 is strange. It does not provide anywhere the basis of its statements and claims. There are no surveys of local people or others to show what people really think. Among its more glaring deficiencies, it fails to examine or even mention the appearance of a plume of air emissions, including steam from the facility. Light from the

25/14 (cont.)

26/05

27/09

28/09

Comment No. 23 **Issue Code: 04**

Most predators, herptile, bird or mammal, in the desert hunt by scent and/or sight with some use of hearing. Those animals whose primary hunting technique include their auditory systems include bats and owls. Memphis State University (1971) found that bats are resistant to jamming. They tend to orient themselves so that noise and return signals are received from different angles. No studies were found on the masking properties of background noise on owls' hunting ability; but personal observation on a barred owl (*Strix varia*) near an active oil pumping site, and an eastern screech owl (*Otus asio*) in a suburban setting, found that they were successful for three years in a row in fledging at least two young per year. If background noise, either natural or man-made, adversely affects a predator, it has an equal effect on the prey.

Comment No. 24 **Issue Code: 09**

The hedgehog cactus (*Echniocereus sp.*) referenced on page 3-37 of the DEIS is not the listed subspecies, Arizona hedgehog cactus (*Echinocereus triglochidiatus arizonicus*). The Arizona hedgehog cactus occurs at elevations of 3,700 to 5,000 feet. Elevations in the proposed Project area ranges from 1,415 to 1,437 feet, which makes the occurrence of the listed species unlikely.

Comment No. 25 **Issue Code: 14**

The commentor raises an important issue. Title VI complaints about the subject plants were filed with EPA. As of November 2000 (last update of status page), both of the Title VI complaints to the EPA were "Under Review" for possible investigation. This means that a complaint was received by the EPA, but no decision has yet been made on whether to reject the complaint because they did not meet regulatory requirements, accept the complaint for investigation, or refer the complaint to another federal agency.

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facility at night will be significant, further destroy the inherent rural desert charm for local residents, and the light may also affect desert animals, many of which are nocturnal.

And at that point I will conclude and provide these.

MR. HARNESS: Thank you. Thank you, Mr. Brittle.

MR. BRITTLE: Uh-huh.

(Mr. Brittle departs the library for the remainder of the meeting.)

MR. HARNESS: Would anyone else like to make any comments?

Yes, sir.

MR. SLAVIN: I probably have questions as opposed to making comments. I gave my name to the court reporter. I'm Francis Slavin, and I'm a lawyer from Phoenix, Arizona. And with me tonight is John Ryan, who is also a lawyer. And we represent Lonesome Valley Farms, whose property is right in the midst of the air where these 230 kV lines are scheduled to run.

Mr. Harness, I think my first question would be -- and we just got this maybe ten days ago -- how long has this thing been out for public

28/09 (cont.)

Comment No. 25 (cont.) **Issue Code: 14**

The commentor's assertion that "all hazardous waste facilities in Phoenix that accept hazardous waste generated offsite are all in low-income communities of color" is not substantiated by any documentation. Hazardous waste would be disposed of in accordance with all applicable regulations. While the proposed Project has no role in the siting or operating of the hazardous waste management facilities, it would be generating some waste that could be disposed of in the subject facilities. No quantification of the impacts of these facilities on surrounding minority or low-income populations has been made, so no calculation of the increase in impacts due to waste from the proposed Project can be made. However, it is evident that any disproportionate impacts to any minority or low-income populations from those facilities would be connected to a degree to the waste originating at Sundance. Thus, the proposed Project would have some disproportionate impact to minority or low-income populations around the subject waste disposal facilities should waste from Sundance be disposed of at either of the subject facilities.

Comment No. 26 **Issue Code: 05**

The DEIS states that spills or leaks of hazardous fluids (e.g., fuel, lubricants, chemicals, etc.) could contaminate the groundwater and affect aquifer use. The extent of the impacts would be minimized by restricting the location of hazardous materials storage, and immediate clean-up of spills and leaks. The procedures used for storage are discussed. In addition, the DEIS discusses the proposed Project's collection of stormwater. See Section 3.5.1.2, page 3-20 of the DEIS.

During exploratory drilling on the proposed Property, a water bearing zone was not found until a depth of 270 feet. As part of the design of the proposed Facility, drains would be installed near all equipment with any probability of oil or fuel leaks. All drains would

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information and take issue with some of the conclusions that are set forth, at least in the environmental consequences tables, and these are the ones S-1 through S whatever 13 at the front.

Let me give you a good example of why I think it's difficult for people who don't make their living reviewing technical bulletins. On Page S-5 where it talks about air quality, I'm curious if anybody here would be able to understand where it says facilities -- it's right -- which would be I guess the air quality, which would be impacted by the -- and I think the word "facilities" refers to the power generating plant; is that correct?

Can someone answer that?

MR. BRIDGES: Yes, sir, that is correct.

MR. SLAVIN: Okay. I guess I'm questioning whether any average person could even begin to understand what all of this stuff means, all these chemical radicles and so on and so forth here.

My suggestion would be is that someone explain this in common everyday English so that the people who live in this area can fully understand what you're talking about here.

29/25

Comment No. 26 (cont.) **Issue Code: 05**

flow to a water/oil separator in the event of a spill. Concrete containment structures would be constructed at the perimeter of this equipment to handle any sheet flow overflows. Concrete foundations and embankments would be constructed around the ammonia and fuel tanks designed to handle any overflow of the maximum amount of ammonia or fuel stored onsite at any time.

Comment No. 27 **Issue Code: 09**

The assessment of visual resources is subjective. In order to increase the objectivity of these assessments, methods have been developed that include factors that can be measured. These factors include points of view, numbers of people using these points of view, and prevalence of the type of resource in the area. These factors are used to determine existing character of the resource, the potential changes to the resource, and the number of people that would be affected. It is true that someone living close to the proposed Facility would have their individual view impacted to a greater degree than the general public.

The DEIS readily discloses that the proposed Facility would be apparent to viewers within three miles of the proposed Facility and would change the characteristic landscape around the proposed Facility. While the plume may be visible during cold mornings, the hot and dry climate conditions in Coolidge would lead to rapid evaporation of the plume during most of the year. The proposed Facility would be a simple-cycle generating facility, not a combined-cycle facility with cooling towers, and would not produce a large steam plume.

Comment No. 28 **Issue Code: 09**

Typically, wildlife species will avoid lighted areas unless lights attract a prey. Nocturnal insectivorous birds and bats would be

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Because, I mean, you probably have it down technically correct. I don't know. You might. But I think it's really a significant imposition on anybody to try to understand this. Now, maybe you've got it later on in more detail. But that just jumped out at me as being something that is potentially problematical.

I would take issue with the conclusion that there are no impacts to existing land status and land uses. I think there will be impacts to these lands. But more importantly, and I haven't found anything in this document that shows this area of the Pinal County, how much of it is in private ownership, how much is in public ownership, and where the direction of growth is coming from in the metropolitan area of Phoenix. I think if you were to look at a map, you would find that this area is probably rural right now, but it's probably moving towards more of a suburban type of environment. And I don't know if that -- I don't believe that's been addressed anywhere in this document. But I think there will be some significant land use impacts from this project.

Another just observation on the noise.

30/01

Comment No. 28 (cont.) **Issue Code: 09**

attracted to insects that would be attracted to the lights at the proposed Facility. This would probably be a significant positive impact. Other, less tolerant wildlife would avoid the proposed Project area.

Comment No. 29 **Issue Code: 25**

Western believes that the DEIS has been written so that the lay person could understand the content of the document. Effort has been made to discuss complex issues such as air quality and EMF in easily understood language. The Summary provides a brief synopses of the information in the DEIS. In order to keep the synopses brief, much of the explanatory discussions of background and context that are included in the body of the DEIS are necessarily omitted.

Comment No. 30 **Issue Code: 01**

A map showing land ownership in the proposed Project area is included in the DEIS on page 3-2. It is difficult to show the direction of growth on a map.

The DEIS reported the current zoning for the land surrounding the proposed Project area in Section 3.1. New information has been developed that some parcels of land in the vicinity of the proposed Site have been proposed for changes to zoning to allow for development of suburban housing. This information has been added to the discussion of cumulative impacts in Section 4.13 of the FEIS.

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that noise model takes into account these 12 engines and when they operate and so on and so forth; is that correct?
MR. MAYES: Yes.
MR. SLAVIN: I think there's an inconsistency in your report with regard to noise, and I would just point this out to you. On Page S-6 under air quality noise, it says that the noise is not expected to exceed 55 dBA and it says this will be 10 dBA above assumed rural background noise level. I go back to Page 3-8, and on this Table 3-3, it says the quiet, rural nighttime dBA is 30. The quiet suburban nighttime is 40. But if this is a rural area and the difference between 55 dBA and 30 seems to me to be a 25 dBA difference.
Is there an explanation for that?
MR. HARNESS: Well, that's the kind of question we're not going to be answering. You know --
MR. MOYES: A simple answer.
MR. HARNESS: We'll take comments --
MR. SLAVIN: Yeah.
MR. HARNESS: -- and we'll answer questions that borderline on the comment process.

31/04

Comment No. 31 **Issue Code: 04**

Table 3-3 of the DEIS presents typical environmental noise for certain outdoor sound levels, as indicated in paragraph two on page 3-8. This data do not represent conditions in the vicinity of the proposed Facility. The DEIS states on page 3-9, paragraph one, that the prevailing ambience in the vicinity of the proposed facility is not 30-35 dBA. The results of a 24-hour noise survey conducted three-fourth mile from the proposed Facility is presented in the DEIS. The study, which was conducted in mid-December, indicated an average noise level of 45.2 dBA for this specific rural area, not the 30 dBA for a typical rural area.

Background noise was measured for a 24-hour noise period on December 14, 2000 near the proposed Site at the Randolph Road/Tweedy Road intersection. The average noise level during the 24-hour period from noon on December 14 to noon on December 15 was 45.2 dBA. The noise at during daylight hours was 47.6 dBA, and the nighttime noise was 41.3 dBA. The average daytime noise was about 45 dBA and the average nighttime noise was about 40 dBA. Had the noise survey been conducted during the peak farming season, rather than mid-December, the results of the survey would likely have been higher than the 45.2 dBA.

The expected noise level at the nearest residences from the proposed Facility is 55 dBA, which is an increase of 10 dBA in noise level from the average of 45.2 dBA. There would be an increase of 14 dBA above the nighttime average of 41.3 dBA. This increase over a short period of time would fall between dramatic and striking. The DEIS states that "a qualitative assessment of dramatic and striking changes in sound level could be considered a significant impact." Therefore, for the nine residences that would experience between a 10 to 14 dBA increase in noise level from the startup of the turbines (i.e., those within approximately one mile of the proposed Facility), the noise impacts could be considered significant.

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MR. SLAVIN: Okay.
MR. HARNESS: -- we do not.
MR. SLAVIN: All right. I don't understand that, but you're running the meeting, so.
On Page S-7 which talks about the EMF effects, and there is a statement in here that says that -- and that's -- and those are electromagnetic fields. It says the magnetic field -- and this is the transmission lines. We're talking about 230 kV lines here. And it says that the magnetic field would be similar to that of a common household appliance. I believe that to be an incorrect conclusion. And I would like to submit for your record now and perhaps at a later date, there is a study put out by the U.S. -- the National Institute of Health. Are you familiar with this study? And it has -- and it's a description of the various impacts of electromagnetic fields. There is a collection of the studies in here regarding the impacts of electromagnetic fields. And I think it would be important to reference this document if it's not so referenced in this draft EIS because it's a significant semblance of work in the area of

32/06

Comment No. 32 **Issue Code: 06**

The Summary states that the magnetic field from the new power lines would be similar to that of a household appliance. The strength of a magnetic field falls off with distance. At the edge of the right-of-way, the magnetic field is much weaker than next to the wire. Outside of the right-of-way a person would experience less magnetic field effects than when standing next to some household appliances. Additional, more detailed information on EMF effects are discussed in Chapter 3, Section 3.4.3.2 and Chapter 4, Section 4.4.3.2.

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electromagnetic fields.
Also, there are EMF publications put out by people like Salt River Project that are not, I believe, so cavalier in making statements that are contained in here; although, I notice later on in the document in the back, if a person wanted to read the detail, there are disclaimers in that regard later on, so on Page 311 and thereafter. But I think that there -- to say that there would be no more impact than those found in a common household appliance I think is just absolutely wrong, false, and misleading, and I would hope that you would correct that.

32/06 (cont.)

My next question is -- and again, I haven't studied this very carefully -- what is the total amount of water that will be necessary for this plant once it's operating at peak capacity?
MR. HARNESS: Is that addressed in the document?
MR. MOYES: Yes, it is.
MR. BRIDGES: Yes, it is.
MR. SLAVIN: All right.
MR. MOYES: Less than a thousand feet.
MR. SLAVIN: Less than a thousand acre feet a year?

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MR. HARNESS: Oh, all right. Thank you.
Yes, sir.
MR. BRIMHALL: I guess I'm going to sound a little dumb compared to these other two guys. But my name is Stacy Brimhall, and we're a property owner --
MR. HARNESS: Okay. Thank you.
MR. BRIMHALL: -- on Tweedy Road. We have a mile of frontage from Woodruff Road down to about a half mile from the project. And this is my partner, Cody Yost.
And our concerns -- Well, first off, we believe that, you know, if you guys bought the property, you should be able to do what you want with it. So I think in some of the other meetings that you've already been through to get your zoning and stuff, we haven't opposed.
But our concerns are that now that you're going to need the transmission lines going through our property, we're pretty concerned about that. And we looked at the three alternatives in this book. And the two first alternatives that go down Tweedy Road, that's -- we believe that's really going to hurt our property values. The third alternative that goes down the backside of

33/19

Comment No. 33 **Issue Code: 19**

The commentor's preference of alternatives is noted. The current land use of the properties over which the each transmission line alternative would run is agricultural. In the future it can be expected that some of this land could be developed for residential housing. The market price of the land would depend on many factors including location, economic factors, local demand for housing, interest rates, aesthetic value, and psychological factors. The fear and the sight of the power lines could contribute negatively to the aesthetic and psychological factors for homeowners in the immediate vicinity of the power lines.

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it is better, but we were hoping you could even go further to the west, maybe through some of that state ground. We -- like I say, we're kind of farmers, so we don't understand all that language about air quality and stuff. But we assume that they'll be according to federal regulations, so that should be okay. And you bought the property and you should be able to do what you want with it.

33/19 (cont.)

But we would like to have someone address our concerns about the power lines, at least in Gilbert where I live. Power lines going through anybody's property really would bring down the values.

33/19 (cont.)

MR. HARNESS: Thank you.
Yes, in the back.
MR. JORDAN: Yeah. I was just curious. Has there been --
COURT REPORTER: I'm sorry. Could you state your name?
MR. JORDAN: My name is Jeff Jordan, Jeff Jordan.
I was just curious if there was an evacuation plan for the folks in Eleven Mile Corner in the event of an emergency.

34/16

Comment No. 34 **Issue Code: 16**

See response to Comment No. 13. Evacuation plans are the responsibility of local emergency planning units, in coordination with the facilities that handle reportable quantities of *Emergency Planning and Community Right To Know Act* (EPCRA) chemicals.

The proposed Facility would rely on both onsite fire protection and local fire protection services. The raw water storage tanks would be the source of water for fire suppression. The emergency diesel-fueled fire pump would enable pumping of storage water to any potential fires for initial suppression of fire. For a large event, response would be from either the Arizona City Fire District, headquartered south of Casa Grande approximately 15 miles south of the proposed Facility, or the Apache Junction Fire District headquartered approximately 20 miles north of the proposed Facility. Municipal fire departments are also in Casa Grande and Florence, both within 10 miles of the proposed Facility. The Gila River Emergency Medical Service provides responses to hazardous materials spill incidents and emergency medical services. The Casa Grande Regional Medical Center provides 24-hour medical emergency service with a staff of 82 medical people.

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MR. HARNESS: Is that something that's addressed in the document?
MR. BRIDGES: I don't know if it's addressed or not. I don't believe it's addressed in the document.
MR. HARNESS: Okay. Mr. Jordan, we'll take that as a comment and we'll address that in our response at a later date.
MR. JORDAN: Another -- I'm sorry.
MR. HARNESS: That's all right. Go ahead.
MR. JORDAN: Another question I have is that: Have those folks been notified that this facility is going to be in the proximity of where they're at? I mean, has there been an aggressive move on the company's part of the regulatory agency to aggressively notify these people of the plant that's going to be there in their area?
MR. HARNESS: There have been prior public notices and public meetings if I'm not mistaken.
Mr. Brimhall, you wanted to --
MR. BRIMHALL: Yeah, I forgot one thing. Stacy Brimhall again.
We bought this land before I guess you

35/16

Comment No. 35 **Issue Code: 16**

The public notifications procedures for the proposed Project are described on page 1-4 of the DEIS. In addition to the federally mandated public notification, Sundance conducted a four-hour long open house at Coolidge High School in August, 2000. Sundance project personnel were available to answer questions concerning the proposed Project. The Eleven Mile Corner Facility has not yet been notified about the details of the proposed Project.

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guys bought yours. But we are processing a zoning case for residential development with a school site in it. And with the things that we've heard tonight on the air quality and such, we're concerned about that and was hoping that maybe one of the people afterwards can talk to us about our zoning case. It's been approved through PNC and going to council. And we'd just like someone to help us out here.

MR. HARNESS: Does anyone else have anything else they'd like to raise?

Mr. Jordan?

MR. JORDAN: You know, I think it's only fair to notify the people of Eleven Mile Corner that this facility is so close to them because they deal with a lot of children that are in need of special needs if -- in education where they deal with students with special needs. And so I think it's only important to let them folks know of what's coming and perhaps through the school board or some of the other meetings to at least let them be aware that it is coming.

35/16 (cont.)

MR. HARNESS: Okay. Thank you.

You can't ask questions or make comments, John.

Slavin, Francis
Phoenix, AZ
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May 3, 2001

HAND DELIVERED

Mr. John Holt, Environmental Manager
Desert Southwest Region
WESTERN AREA POWER ADMINISTRATION
615 South 43rd Avenue
Phoenix, Arizona 85005

RE: Sundance Energy Project – Draft Environmental Impact Statement Dated March, 2001 (the "Draft EIS")

Dear Mr. Holt:

Our law firm represents Gail Robertson and companies owned by her and/or family members which collectively own approximately 3,000 acres of land located within a 5-mile radius of the proposed site of the Sundance Power Generating Facility ("Power Generator"). Some of the new high voltage transmission lines which are proposed to be built in connection with this project will cross through our clients' lands.

This land is currently being used for agricultural production. It is located in the path of future residential growth. Enclosed are maps which depict the land ownership by Federal, State, Native American and private holdings. The maps also depict the location of various master planned communities in the area. Several land owners within the impact area of the proposed Power Generator and consequent high voltage transmission lines have plans to convert their properties from agricultural to residential uses. Our clients intend to master plan and rezone their lands for residential use and to phase out their agricultural operations. Our clients believe that the proposed Power Generator and high voltage transmission lines will have a significant negative impact on the future use and enjoyment of their lands – both for the continuation of agricultural operations and conversion to residential uses. 01/01

Specifically, the Draft EIS does not provide the results of a noise study of the operations of the Power Generator. Without providing the specifications and the operating characteristics of the jet turbines, there is no way for our acoustical consultant, Bob Larabell, to analyze the accuracy or completeness of the conclusions set forth in the Draft EIS that the Power Generator will have minimal impact (see enclosed 2-page report from Mr. Larabell dated April 30, 2001). Moreover, the noise assessment does not take into consideration noise associated with start up or shut down of the jet turbines. Inasmuch as the Power Generator will only be used to address peak demands for electrical energy, there would be frequent cycling on and off of one 02/04

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Comment No. 01 **Issue Code: 01**

The current land use of the properties over which each alternative transmission line would run is agricultural. In the future, some of this land could be developed for residential housing. The market price of the land would depend on many factors including location, economic factors, local demand for housing, interest rates, aesthetic value, and psychological factors. The fear and the sight of the power lines could contribute negatively to the aesthetic and psychological factors for houseowners in the vicinity of the power lines.

Comment No. 02 **Issue Code: 04**

The DEIS considered the manufacturer's estimated noise effects (63 dBA at 400 feet) for each of the 12 LM6000 turbines. Noise propagation equations were used to predict the noise from each turbine at locations at the proposed Property boundary and beyond. The contribution from each turbine was then logrithmetically added to calculate the total noise at each location at the proposed Property boundary and beyond. Noise during a startup sequence would actually be less than during normal operations. This is because the generators are not yet operating during the startup sequence.

Slavin, Francis
Phoenix, AZ
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or more of these turbines. The Draft EIS is devoid of any information as to the anticipated frequency of cycling. Furthermore, the conclusion (page S-6, top) that nearby residences would experience increased noise of 10 dBA conflicts with Table 3-3 (page 3-8) which shows quiet rural nighttime at 30 dBA. Thus, the noise increase would be at 25 dBA which exceeds the level of perception considered to be "striking" (see Section 4-3, page 4-18). Unless the turbines would not be cycling on or off during the "quiet nighttime hours", the increase in noise due to start up and shut down will be very disturbing and disruptive to the residents and become an actual nuisance. 02/04 cont. 03/04 04/04

The air quality analysis draws comparisons against published standards but does not state what impact the emission from the Power Generator would have on nearby residents, nor does it take into consideration the future development of the area with residential subdivisions. There is no consideration given (leaving a person uneducated in this field without a clue) as to impacts on health of present and future residents. If there will be health impacts, then this should be quantified. The land owner should not be forced to employ one or more consultants to interpret the Draft EIS air emission results. If there are health risks, then Sundance cannot escape potential liability because unsophisticated farmers and rural dwellers could not ascertain the risks inherent in the data disclosed. 05/03 06/15

One of the more egregious statements may be found in the summary on EMF effects from high voltage transmission lines found in Table S-1 on page S-7 – "Magnetic fields would be similar to that of common household appliances". This is extremely misleading to an average person who would rely on this conclusion without referring to the specific discussion on EMFs buried in the Draft EIS minutiae (Section 3.4.3.2) under the general heading "3.4 Infrastructure/Waste Management." There is considerable double-talk set forth on pages 3-14 to 3-16 about the health risks associated with EMFs. If you examine the NIEHS 99 report, you will discover that the scientists involved did not conduct new studies or analyze new data of the health risks associated with EMFs. Rather, they sought to reinterpret results from prior studies performed by others. It was an attempt to debunk prior negative reports so as to alleviate regulators and power companies from adopting EMF standards. Several of the scientists had strong ties to power companies, and one-half of the cost of the study conference was underwritten by the powerful power industry. 07/07

I have enclosed a copy of a 1995 publication of the National Institute of Environmental Health Sciences and United States Department of Energy which explains many of the negative health risks associated with EMFs. This report and its contents need to be discussed and disclosed in the Draft EIS. Also, enclosed is a statement published by Salt River Project which discusses the inconclusive results of EMF health based studies and allows the reader to draw his/her own conclusions. Finally, in 1998, on behalf of a client we were defending in a condemnation case filed by Salt River Project, we hired Behavior Research Center to conduct 08/06

Comment No. 03 **Issue Code: 04**
The expected noise level at the nearest residences from the proposed Facility is 55 dBA, which is an increase of 10 dBA from the average noise level of 45.2 measured in mid-December for this specific rural area. There would be an increase of 14 dBA above the nighttime average of 41.3 dBA. Also see response to the Public Hearing Comment No. 31.

Comment No. 04 **Issue Code: 04**
Information about the start-up and shutdown of the turbines has been added to the FEIS. Noise during a startup sequence is actually less than during normal operations. This is because the generators are not yet operating during a startup sequence. However, due to the lower average noise level at night, the noise of the plant would be more disturbing at night than during the day. Also see response to Public Hearing Comment No. 31.

Comment No. 05 **Issue Code: 03**
An analysis of potential health impacts is presented in Section 4.2 of the DEIS. Since all ambient air concentrations are well below the National Ambient Air Quality Standards (NAAQS) which are health based standards, there would be no health impacts. The NAAQS were developed to protect the public health and welfare with a adequate margin of safety.

Comment No. 06 **Issue Code: 15**
The discussion of cumulative impacts in Section 4.13 in the FEIS now includes discussion of the potential for suburban development in the area. An analysis of potential health impacts is presented in Section 4.2 of the DEIS. Since all ambient air concentrations are well below the NAAQS, there would be no health impacts.

Slavin, Francis
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a random digit-dial survey of 400 City of Chandler residents regarding high voltage transmission lines. We have enclosed a copy of the survey results. It proves what we all suspect – that the general public is fearful about living near high voltage transmission lines. No power company or anyone else has figured out a way to address this problem without incurring substantial liability from potential tort lawsuits based on EMF damages to health. Owners of land through which the proposed new high voltage transmission lines will be constructed and operated will suffer value diminution based upon fear of residing near high voltage transmission lines. Also, they are unsightly, which further will lead to value diminution. 08/06 cont. 09/01

Finally, our clients would be operating farm machinery under high voltage transmission lines which are proposed to be built through one of their farm fields. The "field effects" described on pages 3-12 and 3-13 are of grave concern. 10/06

As to the impact on water resources, Sundance purports to rely upon future purchase of excess CAP water, but has not produced any evidence that any such purchase contracts have been secured. Moreover, Sundance has not provided any proof that it would be allowed to pump groundwater for use at the Power Generator. Our clients are concerned about the impact that future pumping of groundwater might have on their farming operations. 11/07

We request that the Draft EIS be rejected and that Sundance be required to provide better and more useful information so that persons who would be most impacted by the proposed project would gain a complete understanding of the forecasted impacts on them and on their lands and that they be given a reasonable opportunity to provide informed input. 12/26

Very truly yours,

Francis J. Slavin

FJS:jaa
Enclosures

cc: Gail Robertson (w/encs.)
John G. Ryan, Esq. (w/encs.)

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Comment No. 07 **Issue Code: 07**

Section 3.4.3.2 of the DEIS provides information regarding the effects of electric and magnetic fields (EMFs). There is considerable uncertainty about EMF and health effects. The DEIS presents the both sides of the published information that is available on the subject, including findings presented in the NIEHS 1999 report. There is no conclusive evidence in the existing studies that indicates EMFs are responsible for health effects. The study published by the Salt River Project on EMF states that studies show that the primary sources of EMF exposure for most people are inside the home and workplace. It further states that people are closer to sources in the home and work place than they are to power facilities. (Also see Salt River Project attachment).

Comment No. 08 **Issue Code: 06**

The information cited and provided by the commentor was considered. See response to Comment No. 07 above.

Comment No. 09 **Issue Code: 01**

The current land use of the properties over which the each alternative transmission line would run is agricultural. In the future, some of this land could be developed for residential housing. The market price of the land would depend on many factors including location, economic factors, local demand for housing, interest rates, aesthetic value, and psychological factors. The fear and the sight of the power lines could contribute negatively to the aesthetic and psychological factors for houseowners in the vicinity of the power lines.

Comment No. 10 **Issue Code: 06**

The general field effects described in Chapter 3 of the DEIS are meant to be informational in that they define the terms used and describe the individual field effects. These discussions include statements that EMF effects are mitigated by placing the power lines high above the

Comment No. 10 (cont.) **Issue Code: 06**
ground to reduce the impact on persons working beneath power lines. The specific EMF impacts are discussed in Chapter 4. Western's power lines are placed high enough that the field effects are minimized and little or no impacts are expected.

Comment No. 11 **Issue Code: 07**
The Central Arizona Water Conservation District (CAWCD) has offered Sundance an Excess CAP Contract for CAP water. This option is currently under consideration by Sundance. Such a contract would be obtained a subsequent to the completion of the EIS. The water use by the proposed Project is anticipated to be roughly equivalent to the current agricultural use.

Groundwater wells already exist on the proposed Site as well as in the general area in the vicinity of the proposed Site. There is no reason to expect that applications for additional groundwater wells would not be approved. Groundwater modeling has been conducted and data have been presented that shows the impacts of groundwater pumping by the proposed Facility would be minimal.

See responses to Public Hearing Comments 18 and 19. Sundance has negotiated and is currently documenting the long-term lease of Type 2 Non-irrigation Grandfathered Groundwater Rights from a private party in the Pinal Active Management Area whose rights are freely transferable and assignable to well(s) on the Sundance property pursuant to the 1980 Arizona Groundwater Management Act (GME), as amended. These Type 2 grandfathered pumping rights would constitute the legal basis for withdrawal of groundwater, if and when needed to backup CAP water outages of a duration sufficient to exhaust the substantial capacity of the Project's onsite water storage. Additionally, as a second supplemental groundwater right, Sundance has the legal right under the GMA, should it so elect, to retire the

Comment No. 11 (cont.) **Issue Code: 07**

irrigated portion of its farm property from irrigation and convert the farm's appurtenant Irrigation Grandfathered Groundwater Rights to Type 1 Non-irrigation Grandfathered Rights for use in the Project's operations. Such retirement and conversion is not currently anticipated to be necessary, and would be inconsistent with the desires expressed by local government officials to retain as much agricultural use of the proposed Property as feasible. However, if necessary, the legal right to do so remains available.

All uses of groundwater by the proposed Project must comply with the GMA and the applicable management plan of the Pinal Active Management Area administered and enforced by the Arizona Department of Water Resources, including industrial user conservation plans, metering, reporting, and payment of groundwater withdrawal fees.

Comment No. 12 **Issue Code: 26**

The commentor's request is noted. The issues raised by the commentor were either addressed in the DEIS or have been addressed in the FEIS. The NEPA process was instituted to provide the public the opportunity for informed input to the decision process.

Tohono O'Odham Nation
Sells, AZ
Page 1 of 2

TOHONO O'ODHAM NATION
CULTURAL AFFAIRS DEPARTMENT
P.O. BOX 837 · SELLS, AZ 85634
Telephone (520) 383-3622

May 1, 2001

John Holt
Environmental Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
Phoenix, Arizona 85005-6475

Dear Mr. Holt:

Thank you, for the opportunity to review and comment on the Sundance Energy Project Draft Environmental Impact Statement your office recently sent to my office.

The Cultural Affairs Office of the Tohono O'odham Nation has the following concerns, comments, questions, and recommendations:

1) On page 3-43, it should be noted that the Casa Grande National Monument is also regarded as a significant traditional cultural place to the Tohono O'odham Nation as well as the Hopi Tribe, Gila River Indian Community and Ak-Chin Indian Community. 01/10

2) Please send the Cultural Affairs Office copies of all archaeological survey reports for the different areas of this project, including the building site, pipelines and transmission. 02/10

3) If cultural resources sites are located during the surveys, every effort should be made to avoid impacting on them. 03/10

Comment No. 01 **Issue Code: 10**
The significance of the Casa Grade National Monument to the Hopi Tribe, Gila River Indian Community and Ak-Chin Indian Community has been incorporated in the discussion of cultural impacts, Section 3.8 in the FEIS.

Comment No. 02 **Issue Code: 10**
The commentor's request has been forwarded to the personnel conducting the cultural consultations.

Comment No. 03 **Issue Code: 10**
Surveys have established the presence of cultural resources in the proposed Project area. Western's Historic Preservation Officer will initiate consultation with the State Historic Preservation Officer and the Tribes to evaluate whether avoidance or mitigation measures are more practical.

4) In Table 5-1 that lists Federal Environmental Statutes Regulations and orders-you should add:

   A) Executive Order 13084 (1998)
   Government-to-Government Relations with Native American Tribal Governments.

   B) Executive Order 13007 (1996)
   Protect and Preserve Indian Sacred Sites.

Sincerely,

Peter L. Steere
Manager Cultural Affairs

04/25

Comment No. 04 **Issue Code: 25**

The Orders have been added to discussion of Cultural Resources, Section 4.8.

United Association

of JOURNEYMEN and APPRENTICES of the
PLUMBING and PIPE FITTING INDUSTRY
of the UNITED STATES and CANADA

RAY A. CARTER
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April 30, 2001

John Holt, Environmental Manager
Western Area Power Administration
Desert Southwest Region
P.O. box 6457
Phoenix, AZ 85005-6457

Re: Comments on the Draft Environmental Impact Statement for Sundance Energy Project.
DEO/EIS-0322

Dear Mr. Holt

The United Association of Plumbers & Steamfitters Local 741 is a Non-profit labor organization that represents the labor interest in Southern Arizona. Over the past eight years we have taken a pro-active stance on **SOCIO-ECONOMIC** and **ENVIRONMENTAL** issues.

SOCIO-ECONOMIC 4.11

Impacts to the local communities will be significant. Sundance/PPL (Pennsylvania Power & Light) has already alluded that an out of state contractor will be utilized for the construction phase of this project. We are currently witnessing the invasion of out-of-state workers from three power plants currently under construction in Arizona. The Griffin Plant in Kingman, the Reliant plant in Casa Grande and the De-Moss plant in Tucson. These impacts from out-of-state workers have devastating effects on the local communities that are felt for years on the local and state tax bases. 01/13

The DEIS for this proposed project has been very careful not to mention any negative impacts. In its own words however, it states." The local economy would be affected by direct project spending and induced economic effects which would occur as a result of employee and business spending income within the area." The impacts of short-term migration of up to three hundred and thirty (330) construction workers to the local area are not examined. However, when out of state contractors are utilized as mentioned above we know that a minimum of 70 to 80% of the workforce will be imported. These workers travel along with these companies from job to job, and state to state. Some will bring their families with them. These workers families move into trailer courts or rent apartments. When their children are placed into community schools burdens are imposed upon these school districts to accommodate for over crowding of classrooms, without any financial assistance. Since out-of-state workers are not required to pay any property taxes this burden is placed on an already strained school district tax base. 02/13

"There Is No Substitution for U.A. Skilled Craftsmen"

Comment No. 01 **Issue Code: 13**

The DEIS discusses the labor pool. The majority of the required labor pool would be available in the Phoenix-Mesa area, which includes Pinal County and Coolidge. To the extent that some specialized skill classes are not available in the Project area, it is assumed that these workers would migrate to the area on a temporary basis during the construction phase. Very few if any out-of-state workers are expected. See response to Comment No. 03.

Comment No. 02 **Issue Code: 13**

The construction of the proposed Project is anticipated to take 12 months. A large part of the work force is expected to commute from Phoenix either daily or weekly. Very few families are anticipated to move to the Coolidge area. Those few families that might move to the area would contribute the same to the local tax base as current local families that rent housing. See response to Comment No. 03.

In 4.11.1 of the DEIS. Sundance/PPL admits on page 4-58 that no agreement has been reached for the treatment of local property taxes. However, it's own (on-going) thus far negotiated tax revenues of 75 million amortized over twenty years are but a fraction of the current liabilities that current business owner must pay. It has already been proven in many communities throughout the country and within our own state that when these out-of-state workers come into our communities that DUI's, crime and drug use instances will increase. Our community's law enforcement agencies will inure added expenses in order to deal with these increases. Again, local & state taxpayers will be asked to pay this unnecessary tax burden imposed upon them. 03/13

Since Sundance/PPL (Pennsylvania Power and light) will be the owner/operator of this facility it is highly feasible that the 8 to 12 permanent employee's will be imported from out-of –state as well.

The DEIS did not evaluate these and other potential social impacts at all. Instead it simply reprinted its own vague assurance it may hire locally. The DEIS did incorporate by reference it's own induced economic effects but, has been obviously been self-promoting. With this in mind it can be assumed that the developer paid for this document and cannot be expected to be an objective study. We believe that the developer's study did not sufficiently analyze the scope of the socio-economic impacts and therefore are requesting that the DEIS be sent back for a more in-depth analyst, one that is not biased. 04/13

ENVIRONMENTAL IMPACTS:

The first observation is that this DEIS is overwhelmingly rife with inconsistencies and contradictions. The DEIS also does not properly examine and analyze the impacts and the alternatives. The DEIS ignores a host of federal requirements in the field of environmental regulation. The DEIS appears to have been written deliberately to not examine or analyze properly the negative impacts of the proposed action, as it fails to really examine the environmental injustices and impacts the proposed facility will create, the adverse health impacts caused by the project, and other quantifiable adverse impacts caused by the facility's operation, such as noise. The DEIS, instead of actually examining the impacts and conducting the analysis of the impacts and an examination of the alternatives, gives many issues "honorable mention." That is, the DEIS attempts to merely mention issues and then dismiss them as "insignificant" without any scientific or logical explanation of the characterizations made about the significance of these issues, or even the proper discussion or analyses required by NEPA. Mere mention of an issue or impact is not sufficient alone to serve as the analysis and exploration of alternatives that are at the heart of, and required by, NEPA. 05/25 06/19 05/25 (cont.)

AIR QUALITY AND HEALTH ISSUES

The DEIS also does not examine any alternatives to the Sundance facility's proposed simple cycle natural gas electrical power generation. And it does not examine the air pollution control technologies available or that will actually be used. It also does not provide any credible analysis of the impacts caused by a Title V, major source of air pollution being put into the environment of the area. The DEIS admits the facility's impacts on air pollution has triggered the Prevention of Significant Deterioration (PSD) analysis requirements, with impacts 50 km away from the 07/25 08/03 09/03

Comment No. 03 **Issue Code: 13**

Personal property tax basis is assessed centrally by the Arizona Department of Revenues. As a Class 3 facility, Sundance would be assessed by ADOR in an equivalent manner with any other manufacturing facility in Arizona. The property tax rates are determined by Pinal County and apply to all personal property, with no special tax breaks granted to any individual facility. The current estimate of local taxes that will be paid by the proposed Project is discussed in the DEIS. The taxes are estimated to run approximately $2 million per year for the proposed Facility. It is difficult to relate taxes to other business liabilities. Due to the nature of tax assessment in Arizona, no negotiations or agreements have been initiated.

The construction workforce is estimated to range between 60 and 330 workers. The DEIS projects that this workforce would come from the Phoenix-Mesa Metropolitan Statistical Area (MSA) which includes Pinal County and Coolidge. No out of state workers are anticipated. Coolidge is within commuting distance of Phoenix and minimal long-term housing of workers is anticipated. The benefit of the revenues to the local economy far exceeds the cost of services provided to a 12 month construction work force and 8 to 12 permanent operators.

Comment No. 04 **Issue Code: 13**

The eight to twelve person full-time staff would include operational and maintenance staff. The required skills are within the capabilities of the Phoenix-Mesa MSA of which Pinal County and Coolidge are part. The impact of this small permanent workforce is not expected to perturb the Coolidge services, school system or tax base. Since the proposed Project is within commuting distance of Phoenix, it is likely that some of the permanent staff may not even reside locally. See response to Comment No. 03.

The DEIS was prepared by a contractor under the direction and oversight of the Western.

power plant's site, then cavalierly shrugs off these impacts as "insignificant." This alone is disingenuous. Of the thousands of facilities in America that must get air pollution permits, a tiny fraction trigger these PSD requirements, so it must be admitted that a facility required to conduct a PSD analysis is a "significant impact" on that basis alone. Outrageously, on page 2-41, the DEIS purports that there will be "Minimal impacts" [to air quality] due to the construction and operation of the proposed Facility." DWA disputes this assertion.

09/03 (cont.)

10/03

The DEIS does not adequately examine the alternative control technologies for the Sundance facility. Long after the work on the DEIS was largely completed, the Pinal County agency that will ultimately issue the air pollution permit notified Sundance that it would require Sundance to utilize a control technology, Selective Catalytic Reduction (SCR).

11/08

SCR entails injecting ammonia into the exhaust across a catalyst bed, causing a reduction reaction that greatly eliminates (controls) NOx. With SCR, NOx can be reduced tenfold from previously achievable levels, to about 2.5 ppm per unit fuel. The agencies that issue air permits are myopic about reducing "criteria pollutants" (CO, VOCs, NOx, SOx, PM10) and ignore other impacts in their considerations. The "risk" from NOx emissions may be traded for the risks from ammonium sulfate, and the public may be getting more risk from the ammonium sulfate.

The SCR technology requires excess ammonia be injected into the exhaust stream so that there will be enough to react, but the excess ammonia combines with sulfates in the air above these power plants to form tiny particles (PM10) of ammonium sulfate. In fact, a significant proportion of all of the PM10 that power plants are projected to emit will be these ammonium salts. **Ammonium sulfate** specifically causes shortness of breath, coughing, and respiratory irritation/inflammation. PM10 (particulate matter 10 microns or less in size) is so small that your lungs are not able to filter them out. PM10 already is the air pollutant that shortens lives (respiratory and cardiac problems) and creates asthma and other respiratory ailments. Now with the effect of the ammonium sulfate, the PM10 will be even more of a problem, perhaps exponentially worse. Each power plant will put out 20-35 tons per years of the ammonium sulfate PM10, and another 80-100 tons per year of "regular PM10," so it is easy to see there will be a cumulative and adverse effect.

Because under the Clean Air Act, all PM10 is assumed to be created equal and assumed to be as harmful as mere dust, the regulatory agencies that issue air permits ignore the known extra and specific chemical hazards associated with some of this particulate matter. This unscientific approach will have especially dangerous and perhaps lethal consequences in areas where power plants using SCR technology operate and proliferate. There is actually reason to believe that it will sicken many and even kill some people. Power plants putting as much as 100 tons of a respiratory irritant into the air, along with hundreds of tons of other particulate matter, will obviously have an adverse impact on people's health.

There are already studies showing that of all the criteria pollutants, PM10 is the pollutant that causes the illnesses and deaths. A December 14, 2000, study titled, "Fine Particulate Air Pollution and Mortality in 20 U.S. Cities, 1987-1994," published in the *New England Journal of Medicine*, concluded, "There is consistent evidence that the levels of fine particulate matter in the air are associated with the risk of death from all causes and from cardiovascular and

Comment No. 05 **Issue Code: 25**

The commentor's opposition to the project, and therefore, the EIS is noted. The commentor's overall judgement of the DEIS is based on the sum of his individual comments that are detailed below. Those individual comments which include examination of alternatives, NEPA and Federal requirements, inconsistencies and contradictions are addressed individually.

Part of the commentor's general and detailed comments stem from the DEIS not describing or evaluating the impacts from new air quality control system. The new air quality control system was mandated by the Pinal County Air Quality Control District after the DEIS was printed and distributed. The evaluation of the new system is included in the amended Section 4.2 of the FEIS.

Comment No. 06 **Issue Code: 19**

The DEIS does examine the negative impacts of the proposed action except those associated with the new air quality control system. These impacts are described in the amended Section 4.2 in the FEIS. See response to Comment No. 01 above. See also responses to Comments Nos. 26, 27, 28, and 29 regarding noise impacts, and Comment Nos. 31 and 37 regarding environmental justice.

Comment No. 07 **Issue Code: 25**

Sundance Energy LLC (Sundance) has applied to the Western Area Power Administration (Western) for an interconnection to Westerns transmission lines in the vicinity of Coolidge, Arizona in Pinal County, southwest of Phoenix. The federal decision is whether to enter into an interconnection and construction agreement with Sundance for the requested interconnection. The only alternatives to this federal decision is not to allow the interconnection or to allow a different interconnection (different routing).

respiratory illnesses. These findings strengthen the rationale for controlling the levels of respirable particles in outdoor air."

And there are other studies that finger sulfates specifically as causing increased mortality. A study titled, "Particulate air pollution as a predictor of mortality in a prospective study of U.S. adults, published in March 1995 in the *American Journal of Respiratory and Critical Care Medicine*, states, "Increased mortality is associated with sulfate and fine particulate air pollution levels commonly found in U.S. cities." A German study, "Environmental air pollution and lung disease in children, states," Sulphates will increase the use of medication and decrease lung function in asthmatic children."

The DEIS is particularly unscientific in this regards. Table 3-2, on page 3-7, shows the 24-hour maximum ambient air concentration of PM10 in Coolidge as 83.6 ug/m3, with the NAAQS Standard at 150 ug/m3. It shows the annual ambient air concentration of PM10 in Coolidge as 39.6 ug/m3, with the NAAQS Standard as 50 ug/m3. This is without the additional burden of the PM10 from the proposed Sundance facility. The additional PM10 from Sundance, which will emit so much PM10 that it requires a PSD analysis, will undoubtedly move the ambient air concentrations of PM10 upwards, and closer to the limits of the NAAQS Standard. There obviously will be an impact on health and mortality in the area near Sundance as the power plants emissions of PM10 are added onto the burden that is already there. The DEIS never deals with this obvious information. The impacts of the additional PM10 must be fully analyzed and addressed. Again DWA references the December 14, 2000, study titled, "Fine Particulate Air Pollution and Mortality in 20 U.S. Cities, 1987-1994," published in the *New England Journal of Medicine*. In this study, the investigators used a single analytic approach to examine the association between PM10 concentrations in a given 24-hour period and the numbers of deaths reported on the following day in 20 of the largest cities and metropolitan areas in the United States, including Phoenix. The study found an average increase in the rate of death from all causes of about 0.5 percent for every increase in the PM10 concentration of 10 micrograms per cubic meter. The PM10 concentrations were positively associated with daily mortality rates in most of the 20 cities studied and at concentrations well below the current 24-hour standard of 150 micrograms per cubic meter. In fact, the 90th percentile of the distribution of daily values was below the 24-hour standard in each of the 20 cities. Moreover, the association was specific to PM10. The finding of a strong association between the PM10 concentration and the rate of death from cardiovascular and respiratory causes offers support for the idea that the concentrations of particulate air pollution influence mortality. 12/03

After reviewing the science, anyone who would claim that the Sundance Energy facility would create minimal impacts is totally irresponsible. It is also with complete scientific basis to say that more asthma and other respiratory diseases will be caused or aggravated by this major pollution source. Of course, this kind of bogus DEIS and bogus NEPA process is to be expected when agencies are not objective and merely go through the motions of an essentially counterfeit NEPA process in order to serve their corporate masters, urged on by the bureaucrats who fawn upon them. 12/03 (cont.)

Further, the fact that the SCONOX technology, which is also considered BACT by EPA Region 9, is not at all considered or evaluated as an alternative to SCR, belies the deficiencies of this 13/03

Comment No. 07 (cont.) **Issue Code: 25**

The decisions associated with siting, design, construction, and operation of the proposed Facility are not federal decisions. These decisions are regulated, approved, and overseen by the State of Arizona. Therefore, different sites, designs, and operational factors are not alternatives to the Federal decision. However, the impacts resulting from these decisions are interconnected with the decision to allow interconnection. If no interconnection was allowed, the proposed power plant would not be built regardless of design. Therefore, the potential impacts from the siting, design, construction and operation of the proposed Facility are connected to the federal interconnection decision. This EIS examines the impacts of the interconnected actions, even those actions that are not federal decisions.

Comment No. 08 **Issue Code: 03**

The decision as to which air pollution control technology to implement at the proposed Facility is up to the Sundance and the appropriate state and/or local regulatory agencies. It is not Western's decision. However, the impacts associated with the outcome of that decision are discussed in this EIS. It is the charter of the air quality regulatory agency to analyze the applicant's permit requests, and regulate the manner in which a project may operate with respect to air quality laws and regulations.

In conjunction with the Sundance Energy DEIS, a PSD air permit application was submitted to the Pinal County Air Quality Control District (PCAQCD), the regulatory agency charged with administering air quality laws and regulations in Pinal County. As part of the PSD application, an analysis of control technologies was presented and evaluated. A draft permit and associated technical Support Document were issued for public review April 27, 2001. These public documents may be examined by contacting the PCAQCD.

DEIS. SCONOX, if used at Sundance and not the SCR technology that it currently proposes and that is not even explored by the DEIS, would eliminate the ammonia, the ammonium sulfates, the inherent risks of storage and transportation of the ammonia, and would actually control the emissions of criteria air pollutants better than the SCR technology.

13/03 (cont.)

On page 4-10, in the discussion of Hazardous Air Pollutants, the potential ambient air impacts were voluntarily evaluated using the Arizona Ambient Air Quality Guidelines (AAAQG) as a criteria to evaluate potential health risk, with the assertion that if the "predicted concentrations are below the AAAQG, then it can be concluded that no health risks result." The AAAQG, and the methodology used to produce them, have never been peer-reviewed, and represent an entirely unproved standard. Further, neither the AAAQG nor the DEIS in any other way consider or evaluate the synergistic or cumulative effect of these Hazardous Air Pollutants, the criteria pollutants that the Title V major source will emit, or the aforementioned ammonium sulfates. But NEPA ***specifically*** requires an examination of the cumulative effects of a proposed significant federal action, so this DEIS is invalid in these respects, and must be undertaken again with a close eye on the statutory requirements.

14/03

15/25

RISK MANAGEMENT PLANNING ISSUES

As if that wasn't enough, there is the issue of the ammonia stored on-site at the power plant and the additional risks the ammonia presents. It will common to see 15,000 to 20,000 gallon tanks of ammonia stored at these facilities. Anhydrous ammonia is particularly dangerous, but even aqueous ammonia is risky. A catastrophic release of ammonia from a 15,000 to 20,000 gallon tank would be enough to kill and injure people a few miles away, depending on weather conditions. Facilities with this much ammonia on-site have to report and participate in a new federal program required by 112r of the Clean Air Act called the Risk Management Program if the ammonia on-site is 20% or greater concentration. Otherwise, the facility will still have to file Tier Two reports as required by the federal Emergency Planning and Community Right-To-Know Act (EPCRA) and develop a facility emergency plan that includes methods of notifying the public and the response agencies that a release has occurred. For a perspective, there are less than 18,000 RMP facilities in the entire nation reporting to the EPA.

16/15

In the rural areas, such as the Sundance facility site, there will not be sufficient resources to respond quickly enough to prevent deaths and injuries. The responders simply do not have the equipment and infrastructure. People can shelter from the ammonia, but it will infiltrate their homes within a given amount of time and reach harmful or even lethal concentrations before the responders can arrive. When the release occurs, unless a rescuer arrives in a timely manner with his/her own SCBA (self-contained breathing apparatus) and one for each person to be rescued, there will be fatalities and injuries. The may also be issues of evacuation routes sufficient to allow a timely evacuation. And there will be issues of notification and preparation.

17/15

16/15 (cont.)

Both rural and urban areas will see a heightened risk along the transportation route of the ammonia. A tanker of ammonia could harm people 2-3 miles on either side of the transportation corridor, in the event of an accident that ruptures the tanker. Only one out of four chemical spills are transportation incidents. Far more occur during the off-loading of a chemical at the industrial site.

18/12

Comment No. 09 **Issue Code: 03**

A PSD New Source Review is triggered if estimated emissions of any of the criteria pollutants exceed 250 tons per year. Key components of the PSD review are a determination of Best Available Control Technology and an analysis of ambient air impacts. If the ambient air impacts exceed the EPA's "significance criteria", then a cumulative air quality analysis is completed to ensure that the PSD Class II incremental increases are not exceeded. However, in no case may the facility's emissions cause an exceedance of the National Ambient Air Quality Standards (NAAQS) established by the Clean Air Act. The analysis for the proposed Facility indicated that the maximum ambient air impact for all pollutants, and applicable averaging periods, were less than 4% of the NAAQS. These maximum impacts were on the top of a ridge approximately seven miles west/northwest of the proposed Facility. In Coolidge, as well as at the locations of residences within five miles of the proposed Facility, the maximum impacts were less than one percent of the NAAQS.

Comment No. 10 **Issue Code: 03**

See response to Comment No. 09 above.

Comment No. 11 **Issue Code: 08**

The new air quality control system was mandated by the Pinal County Air Quality Control District after the DEIS was printed and distributed. The FEIS includes the evaluation of the new system. See the amended air quality analysis in Section 4.2 in the FEIS that incorporates the use of Selective Reduction Catalysts to reduce NO_x emissions by 80%.

Comment No. 12 **Issue Code: 03**

See the amended air quality analysis in Section 4.2 in the FEIS. The NAAQS for the annual PM_{10} concentration is 50 $\mu g/m^3$. The annual average PM_{10} ambient levels in Coolidge have been recorded as 39.6 $\mu g/m^3$ or 79% of the NAAQS. The maximum impact analyzed

None of these issues are examined at all, yet all are federal environmental regulations. This is a glaring error in the DEIS.

18/12 (cont.)

There is no examination at all in the DEIS of other control technologies, such as SCONOX. SCONOX does not require the use of ammonia, so no ammonium sulfates are formed, and it actually reduces other pollution, such as VOCs, CO, and SOx. Until the full review and analysis of these and other appropriate control technologies is undertaken, the DEIS is entirely deficient.

19/03

FACILITY DESIGN ALTERNATIVES

Actually, there should be a review of the plan to use natural gas as a fuel and the types of electrical power generating plants that could be used. There is no examination of producing the peaking power that Sundance is planned to do in another way or at another site. For example, there will be plenty of baseload power plants being built that could produce extra power to be used when peaking power is needed. Using excess power generated at baseline plants to convert water into hydrogen and oxygen, then using the hydrogen as a fuel for peaking power, could be an alternative. This alternative would produce no carbon dioxide, no carbon monoxide (CO), virtually no SOx, far less particulates, and far less NOx than the currently proposed facility. There would also be more oxygen in the air as a result.

20/19

METHODOLOGY

There are also some very strange things in the DEIS. For example, on page 2-5, there is this statement: "Under optimal ambient conditions with the air temperature near 20 (degrees) F, Configuration 2 could generate about 647 MW." It is almost absolutely unlikely that this climatic condition will occur in the area of the facility, especially when the average minimum temperatures are reviewed at Table 3-1 on page 3-5. It is more likely that the temperature would be 100 degrees F! And since it is a peaking power plant, the likelihood of this type of cold causing the use of the peaking power plant is nil. This is, however, a classic example of how this DEIS rambles along with disingenuous analysis and circumstance, instead of focusing on reality and the required analysis and examination of alternatives that NEPA requires.

21/03

The discussion on 2-7 regarding the generating facility is outdated and clearly shows that the design of the power plant is different now than what the DEIS states it to be. For example, the 6,500 hours of operation is not at all correct. The facility will get an air permit allowing 8,760 hours of operation.

22/03

WATER ISSUES

The discussion about water use that starts on 2-9 does not fully examine the impacts of where the water will come from. To fully examine this, the actual source of the water (CAP or groundwater) needs to be stated. If the CAP water will come from the Gila River Indian Community or the San Carlos Apache Tribe, then the DEIS must examine the impacts of this on those tribal entities. If it will be from groundwater pumping, then the assertions made in the DEIS are questionable, at a minimum.

23/07

Comment No. 12 (cont.) **Issue Code: 03**

for the annual PM_{10} from the proposed Facility was 0.93 $\mu g/m^3$ or 0.19% of the NAAQS, a 2.4% increase over the measured background level. When Sundance's maximum impact is added to the background, the total is 40.53 $\mu g/m^3$, or 81% of the NAAQS. The NAAQS were established by the Clean Air Act to protect the public health and welfare with an adequate margin of safety. A level of 80% of the NAAQS provides the protection mandated by the Clean Air Act.

Comment No. 13 **Issue Code: 03**

See response to Comment No. 08 above. The application of SCONOx was evaluated in the Best Available Control Technology of the PSD permit application submitted to the Pinal County Air Quality Control District. SCONOx was rejected for the proposed Facility because it is not technically feasible for simple cycle turbines because their exhaust temperature is higher than the optimal operating temperature range of SCONOx.

Comment No. 14 **Issue Code: 03**

The AAAQGs were developed by the Arizona Department of Health as health-based guidelines for contaminants in air. AAAQGs are residential screening values that are protective of human health including children. The AAAQGs are used as tools to decide which air emissions are at a level where they should be evaluated further. Chemical concentrations in air that exceed AAAQGs may not necessarily represent a health risk, but further modeling or calculation is required to assess whether there is a true threat to human health.

While the AAAQGs are not peer reviewed in the way a scientific paper is, they were derived from occupational exposure limits established or recommended by the U.S. Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety and Health (NIOSH), and the National Institute for Environmental Health Science (NIESH). The most protective

On 4-31, the DEIS states that subsidence from dewatering has occurred within the basin, but that the groundwater pumping that might result from the operations of the proposed Sundance facility is not expected to cause subsidence *in the area*. (Emphasis added.) This is disingenuous. The DEIS provides no substantiation for this conclusion. Besides, if subsidence within the basin is already occurring due to groundwater pumping, it is *obvious* that pumping more groundwater from the same aquifer will result in more subsidence *somewhere* in the basin. The analysis ignores this obvious fact, trying to divert attention to the subsidence impact by making the unsubstantiated and undefended claim that subsidence is not expected to occur in the area, and is therefore deficient in examining the impacts of the proposed groundwater pumping for providing the water needs of the facility.

24/07

The discussion on 4-33 regarding the blended wastewater to make it suitable for irrigation does not discuss or examine the effect this will have in speeding up the salinization of the soils or groundwater. These impacts must be fully examined and quantified.

25/07

NOISE

There are discussions about the noise impacts in different parts of the DEIS, and there are contradictions and illogic illustrated in the handling of the noise impacts. The DEIS states that the ambient background noise level at the proposed site is about 40-45 dBA (3.3.1 at 3-9), and that the additional noise from the power plant at start-up and shutdown will be an additional 10 dBA, which puts the noise level up to about 55 dBA. This would bring the noise level up to about the level of noise at a commercial area.

26/04

That noise level certainly would destroy the rural nature and atmosphere of the people living near the Sundance power plant! This is a real quality of life issue. Further, the DEIS states on 4-18 that "Changes in sound levels of +/-10 dBA within a short time span may be perceived as **dramatic**..." (Emphasis added.) But the DEIS also purports that "Normal operation excludes intermittent activities such as start-up, shut down, and any emergency or upset conditions." This is really disingenuous, and betrays the pro-facility agenda of the DEIS. This is a peaking power plant, so it is designed to start-up and shut down often. To exclude start-up and shut down from "normal operations" is a fundamental, inappropriate, contradiction to logic.

27/04

The real story here is that local area residents, a low-income, ethnic minority community, will get "dramatic" noise disturbances at least daily, and more likely many times per day, and that makes the additional noise a significant impact. If this were to be a power plant that operated continuously, a baseline power plant, then the human ear could get accustomed to the noise and tune it out, but that is not the case here. The people who live there will get the noise of a suburban setting foisted upon them in a "dramatic" manner, and not the noise level of the rural setting that they currently enjoy. To not characterize this additional noise as a significant impact is unconscionable.

28/04

Desert animals will also be affected by this noise. Predators, which use sound to track their prey, will be unable to hear their prey when the power plant starts up or shuts down and creates a "dramatic" sound event.

29/04

Comment No. 14 (cont.) **Issue Code: 03**

standards or recommended levels from the U.S. and other countries were used. Many of these standards have undergone peer review as well as regulatory and legislative review.

See the amended air quality analysis in Section 4.2 in the FEIS. Hazardous air pollutants were evaluated against the AAAQG and all impacts except the annual averaged formaldehyde are predicted to be less than one percent of the AAAQGs. The annual formaldehyde value was seven percent of the AAAQG. It is beyond the scope of this NEPA process to evaluate the adequacy of standards that have been implemented by Federal, State, and local agencies.

Comment No. 15 **Issue Code: 25**

The cumulative effects of air pollutants for the entire Phoenix area are discussed in the FEIS. The synergistic effects of combinations of chemicals are only beginning to be explored. There are very few human studies on binary pollutant exposure. Studies to date have shown that there are possible additive or synergistic effects when ozone combines with sulfur dioxide, nitrogen dioxide, carbon monoxide, sulfuric acid, or other particulate aerosols. These synergistic effects can include greater decreases in lung function for some people concurrently exposed to ozone and other pollutants than for either pollutant alone. However, exercise, smoking status, and existing pulmonary disease can also result in increased sensitivity to individual pollutants.

As for not evaluating ammonia sulfates, the DEIS was issued before the Pinal County Air Quality Control District decided that the proposed Facility should use the Selective Catalytic Reduction (SCR) method. The FEIS discusses the impacts associated with the use of this air quality control method at the proposed Facility in the amended air quality analysis in Section 4.2 in the FEIS.

ENDANGERED SPECIES ISSUES

Desert plants and endangered species are also not adequately or even scientifically examined in the DEIS. The DEIS acknowledges that hedgehog cactus is an endangered species and that the hedgehog cactus occurs on the proposed site and along the proposed pipeline route (3-37). Later (4-40), the DEIS has the unfounded audacity to proclaim, "No highly safeguarded cacti were observed in the proposed Project area..." This is another of those contradictions that the DEIS is rife with. This contradiction/misrepresentation is part of a disturbing pattern in this DEIS, which smacks of racketeering and/or fraud. 30/09

HAZARDOUS WASTES/ENVIRONMENTAL JUSTICE ISSUES

On 4-23, the DEIS states, "The Project would dispose of hazardous materials at a hazardous waste facility either in Coolidge or another location in Phoenix." This ignores well-known environmental justice issues in that there has been a civil rights/environmental injustice claim filed with USEPA regarding the sitting and permitting of the Heritage hazardous waste facility near Coolidge (which is the one the DEIS refers to) as well as a civil rights/environmental injustice claim filed with USEPA regarding the proposed permitting of the Innovative Waste Utilization hazardous waste facility in Phoenix. All of the hazardous waste facilities in Phoenix that accept hazardous wastes generated off-site are in low-income communities of color, which raises civil rights and environmental justice issues. That the DEIS does not investigate these issues puts it on track to violate the federal Civil Rights Act and related laws, and further constitutes a violation of NEPA. 31/14

The impacts from spills of hazardous fluids are not addressed. Instead, the DEIS in essence purports that there won't be any spills, which is an entirely unrealistic and unsubstantiated assurance. There could be a very significant impact to the groundwater from a spill of hazardous fluids, as the groundwater is only 75 feet below the surface. A realistic review of the impacts of a spill of these hazardous fluids must be undertaken to comply with NEPA. 32/05

VISUAL RESOURCES

The discussion of Visual Resources that begins on 4-49 is strange. It does not provide anywhere the basis of its statements and claims. There are no surveys of local people or others to show what people actually think. Among its more glaring deficiencies, it fails to examine or even mention the appearance of the plume of air emissions, including steam, from the facility. The light from the facility at night will be significant, and further destroy the inherent rural desert charm for local residents. The light may also affect the desert animals, many of which are nocturnal. 33/09 34/09

On 4-52, in the discussion regarding the visual impacts to the Casa Grande National Monument, consultations with the Hopi Tribe, Gila River Indian Community, and Ak-Chins are mentioned as ongoing. That would make premature any conclusion that there are no impacts. 35/11

Comment No. 15 (cont.) **Issue Code: 25**

The ambient air impacts analyzed for Hazardous Air Pollutants (HAPs) were far below the AAAAGs established to protect public health. The combination of miniscule ambient air impacts from the Sundance Facility and no other significant sources of HAPs nearby would result in a meaningless analysis.

Comment No. 16 **Issue Code: 15**

The proposed Facility would have the capacity to store up to 30,000 gallons of aqueous ammonia for injection into the SCR air pollution control system. The aqueous ammonia solution, less than 20% ammonia and more than 80% water, would be stored in two 15,000-gallon tanks on the Site. Upon the ammonia arrival to the Site, ammonia would be pumped into one of the two ammonia storage tanks (see Figure 2-1, Proposed Facility Configuration). A concrete containment area would be constructed around the tanks with a sufficient volume to handle the discharge of one 15,000-gallon tank. After the ammonia hose is connected from the truck to the tank, a second vapor recovery hose would be connected from the top of the tank back to the truck to contain any residual vapors that may be in the ammonia tank. In the unlikely event of spills during the delivery of ammonia or during operations, water hoses would be immediately available to dilute the spilled ammonia within the containment area. Operation of the SCR would not involve any high pressure release of ammonia vapor. The aqueous ammonia is pumped from the storage tanks to the SCR reactor chamber in liquid form. The ammonia is then heated sufficiently for vaporization, and then injected into the SCR for mixture with the exhaust stream.

Comment No. 17 **Issue Code: 15**

NEPA guidelines do not specifically require an assessment of emergency response capabilities and the assessment of potential impacts of accidents does not usually take into account any emergency response. The impacts of accidents to the general public

HEALTH IMPACTS FROM PAVING ROADS

Inhaling asphalt fumes sickens some people; this permanently harms some. The health impacts on local people by the road paving are not examined. 36/15

ENVIRONMENTAL JUSTICE 4.12

The DEIS' section on environmental justice ignores the 200+ Hispanics that live around Eleven Mile Corner. DWA disputes the DEIS assertion that there are "no adverse impacts to human health or the environment." Curiously, the DEIS contradicts itself starting on page 4-63 when it discusses "Unavoidable Adverse Impacts." 37/14

Sincerely,

Wayne Bryant
Organizer

Comment No. 17 (cont.) **Issue Code: 15**

are assessed as if no mitigation would take place. It is often assumed that a person with no protection is located in the worst place for 24 hours a day, 365 days a year. Impacts to the general public are usually assessed using maps of entire populations in the area. No evacuations are assumed. Any emergency response plans, or evacuation capabilities are usually discussed in terms of mitigation of the potential impacts of an accident. Now the SCR air quality control method has been designated by the Pinal County Air Quality Control District, an assessment of potential accidents associated with the storage and transportation of ammonia has been included in the FEIS.

The proposed Facility would rely on both onsite fire and local fire protection services. Raw water storage tanks would be the source of water for fire suppression. An emergency diesel-fueled-fire pump would enable pumping of storage water to any potential fires for initial suppression of fire. For large fires, response would be from either the Arizona City Fire District, headquartered south of Casa Grande, approximately 15 miles south of the Facility, and the Apache Junction Fire District, headquartered approximately 20 miles north of the proposed Facility. Municipal fire departments are also in Casa Grande and Florence, both within 10 miles of the proposed Facility. The Gila River Emergency Medical Service responds to hazardous materials spill incidents and emergency medical services. The Casa Grande Regional Medical Center provides 24-hour medical emergency service with a staff of 82 medical people.

Comment No. 18 **Issue Code: 12**

Since the SCR air quality control method has been designated by the Pinal County Air Quality Control District, an assessment of potential accidents associated with the storage and transportation of ammonia has been included in the FEIS.

Comment No. 19 **Issue Code: 03**
See response to Comment No. 08 above.

Comment No. 20 **Issue Code: 19**
See Response to Comment Nos.07 and 08 above.

Comment No. 21 **Issue Code: 03**
See the amended air quality analysis in Section 4.2 in the FEIS. The referenced discussion indicates that 20 degrees Fahrenheit is the optimal temperature to get the maximum output from the turbines. This temperature is not expected. Therefore, the nominal output is 600 megawatts or less at expected temperatures. NEPA documents are expected to discuss the capability of the systems being analyzed.

Comment No. 22 **Issue Code: 03**
The air permit requires a conservative calculation of the potential air pollution of the proposed power plant. Initially the preliminary air permit calculations used the conservative estimate of 8,760 hours. The amended air permit calculation now uses a conservative estimate of 7,500 hours. The proposed power plant is a peaking power plant. It would not be economical to run all of the time. The 6,500 hours of operation is the expected annual maximum for operation and is the figure used for calculating water consumption and other impacts. See the updated air quality analysis in the amended Section 4.2 in the FEIS that reflects the operating conditions listed in the Draft Air permit issued for public comment conditions.

Comment No. 23 **Issue Code: 07**
The source of CAP water will be a contract for excess CAP water delivery between Sundance and Central Arizona Water Conservation District (CAWCD). The contract has been pre-approved by CAWCD's Board of Directors and was offered to Sundance on January 12, 2001. Its execution is pending completion of a wheeling agreement between Sundance and Hohokam Irrigation District (HID) to transport the water from CAWCD's main canal through

Comment No. 23 (cont.) **Issue Code: 07**

Hohokam's existing canals to the proposed Facility. The existing canal adjacent to the site has significant excess capacity beyond the needs of the proposed Project without upgrade or modification requirements. Wheeling service by HID has been assured by its manager and board members. The wheeling contract is currently in the negotiation and drafting stage. The wheeling contract must be executed before CAWCD will execute the offered CAP Excess Water contract. CAP water for the proposed Project would not come from any Indian communities or tribes.

Sundance is considering, and is in preliminary negotiations concerning the possible provision of CAP water from parties who hold existing long-term, firm subcontracts from CAWCD for substantial amounts of water not currently utilized or anticipated by those parties to be fully utilized during the life of the proposed Project. Subcontractors include several Indian tribes or communities. No such commitment or arrangement has been discussed by Sundance with any Indian CAP allotee.

The worst case scenario, a hypothetical assumption that no CAP water was delivered to the proposed Facility, would require reliance on existing or new groundwater wells on the proposed Property for full water requirement of the proposed Project. This worst case hypothetical scenario has been analyzed by independent professional hydrologists and again by the Arizona Department of Water Resources (ADWR.) They have also analyzed the impact of the normal case scenario of projected emergency backup reliance on groundwater during anticipated short-term unplanned and planned outages of the CAP delivery system. See *Memorandum* dated November 30, 2000 and supplemental *Memorandum* dated March 15, 2001, by Greg Wallace, ADWR Chief Hydrologist. ADWR has determined that under either scenario (intermittent backup use of groundwater or full reliance on groundwater for the life of the plant), the impact on the local groundwater table and groundwater rights and

uses by surrounding landowners will be minimal and consistent with the Pinal Active Management Area Management Plans.

Since the proposed Facility would be a simple cycle facility with no cooling towers, there would be no impact to groundwater because of the relatively small water requirement from a very large regional aquifer. ADWR, in its November 30, 2000 memorandum, notes the dramatic rise in the local water table in recent years as follows: *"Since the mid-1980s, water levels in the area around the proposed plant site have risen by as much as 120 feet."* Groundwater use by the Sundance Project, in its worst case hypothetical scenario, is anticipated to only slightly decrease the rate of that ongoing water table recovery.

Comment No. 24 **Issue Code: 07**

See response to Comment No. 23 above. Regional subsidence is an *historical* phenomenon not common to all lands or soils in the region, but nonetheless extensive in some locations in Pinal County. Historically, subsidence has been the result of severe groundwater overdrafting. However, in the last two decades, there have been dramatic reversals of overdrafting conditions in the region (see ADWR Memorandum cited in Comment No. 18 which confirms a substantial rise in local water tables). As discussed in the DEIS, subsidence due to historical groudwater pumping would not be further impacted by the proposed Project. ADWR has confirmed that the minor amount of water required by the proposed Facility, in the context of a rapidly rising water table in a very large aquifer, will have minimal impacts of only a slight decrease in those recovery rates.

The proposed Project's plan is to use groundwater for backup only. This will significantly *decrease* the amount of groundwater use at the Sundance irrigated property compared to historical and recent irrigation pumping of groundwater. Therefore, the proposed Project

Comment No. 24 (cont.) **Issue Code: 07**
would decrease any risk of subsidence due to historical groundwater pumping.

Comment No. 25 **Issue Code: 07**
The quality of discharged water would be equal to or better than the quality of the existing groundwater wells located on the proposed Property. Water from these wells historically has been used for irrigation in the area around the proposed Facility. Typical total dissolved solids (TDS) values of this groundwater source have been near 2,700. Sundance would mostly use CAP water to operate the proposed Facility. Wastewater from the water treatment facilities on the proposed Site would be blended with the CAP water before any application for irrigation purposes. Water applied for irrigation would have a resultant TDS similar to levels found in the groundwater. Amended Table 4-17 in Section 4.5 of the FEIS shows the comparison of the wastewater before and after blending and the groundwater.

Chloride levels in the blended waste water would be approximately 300 mg/L. This would be below the current groundwater chloride levels of approximately 735 mg/L that have been applied to crops. The blended wastewater chloride level would be slightly above the Federal Secondary Maximum Contaminant Level of 250 mg/L for drinking water (40 CFR Part 143.3).

The blended wastewater that would be applied to adjacent crops represents a fraction of the irrigation water that would be applied to the crops. Since the TDS and chloride levels would be less than in the groundwater that has historically been applied to these crops, the probability of salinity buildup would be decreased on these crops. According to the landowner where these crops would be irrigated by the blended wastewater, a larger portion of the irrigation would be supplied by CAP water. Furthermore, flood irrigation would be applied periodically to these crops to leach the salts from the soils.

Comment No. 25 (cont.) **Issue Code: 07**

The blending procedures and the final water quality required for irrigation purposes will by law be in compliance with the Reclaimed Wastewater Reuse Permit issued and administered by the Arizona Department of Environmental Quality in accordance with the Arizona Administrative Code R18-9-701 through 707.

Comment No. 26 **Issue Code: 04**

Table 3-3 of the DEIS presents typical environmental noise for certain outdoor sound levels. These data do not represent conditions in the vicinity of the proposed Facility. The DEIS report stated on page 3-9, paragraph one, that the prevailing ambience in the vicinity of the proposed facility is not 30-35 dBA. The results of a 24-hour noise survey conducted three-fourth mile from the proposed Facility is presented. The study, which was conducted in mid-December, indicated the average noise level is 45.2 dBA for this specific rural area, not the 30 dBA for a typical rural area.

Background noise was measured for a 24-hour noise period on December 14, 2000 near the proposed Site at the Randolph Road/Tweedy Road intersection. The average noise level during the 24-hour period from noon on December 14 to noon on December 15 was 45.2 dBA. The noise at during daylight hours was 47.6 dBA, and the nighttime noise was 41.3 dBA. The average daytime noise would be about 45 dBA and the average nighttime noise would be about 40 dBA. Had the noise survey been conducted at peak farming season, rather than mid-December, the results of the survey would likely have been higher than the 45.2 dBA.

The expected noise level at the nearest residences from the proposed Facility is 55 dBA, which is an increase of 10 dBA in the noise level from the average of 45.2 dBA. There would be a 14 dBA increase above the nighttime average of 41.3 dBA. This increase over a short period of time would fall between dramatic and striking. The DEIS states that “a qualitative assessment of dramatic and striking changes

Comment No. 26 (cont.) **Issue Code: 04**

in sound level could be considered a significant impact." Therefore, for the nine residences that would experience between a 10 to 14 dBA increase in noise level from the startup of the turbines (i.e. those within approximately one mile of the facility), the noise impacts could be considered significant.

An additional consideration is that the turbines and generators would not start up instantly. Noise during a startup sequence would actually be less than during normal operations. The turbines start at low revolutions then speed up. The generators do not operate until the turbines are up to speed. This "spreads" out the startup noise over at least couple of minutes. The time period over which shutdown occurs depends on the nature of the shutdown. If all turbines and generators performed an emergency shutdown at the same time the cessation of noise would be dramatic.

Development of some of the nearby parcels of agricultural land into housing subdivisions would have several cumulative noise effects on the surrounding community. There would be more people nearby to experience any noise from the proposed Facility. The development would likely increase both the daytime and nighttime background noise levels whether or not the proposed Facility is built. The increase in background noise would make the noise from the proposed Facility relatively less noticeable.

Comment No. 27 **Issue Code: 04**

The noise from startup and shutdown of the turbines and generators was discussed in Section 4.3 of the DEIS and in the response to Comment No. 26 above. The nature of a peaking power plant does include more frequent startup and shutdown sequences than a base load power plant. However, the nature of electrical demand does not cause peaking power plants to startup and shutdown several times in a few hours. The number of turbines and generators that are operating while the proposed Facility is operating may change fairly

Comment No. 27 (cont.) **Issue Code: 04**
frequently, however, once one turbine/generator set is operating and producing noise, the startup or shutdown of other sets is less noticeable.

Comment No. 28 **Issue Code: 04**
See responses to Comment Nos. 26 and 27 above.

Comment No. 29 **Issue Code: 04**
Most predators, herptile, bird or mammal, in the desert hunt by scent and/or sight with some use of hearing. Those animals whose primary hunting technique include their auditory systems include bats and owls. Memphis State University (1971) found that bats are resistant to jamming. They tend to orient themselves so that noise and return signal are received from different angles. No studies were found on the masking properties of background noise on owls hunting ability, but personal observation on a barred owl (*Strix varia*) near an active oil pumping site, and an eastern screech owl (*Otus asio*) in a suburban setting, found that they were successful for three years in a row in fledging at least two young per year. If background noise, either natural or man-made, adversely affects a predator, it has an equal effect on the prey.

Comment No. 30 **Issue Code: 09**
The hedgehog cactus (*Echniocereus sp*.) referenced on page 3-37 of the DEIS is is not the listed subspecies, Arizona hedgehog cactus(*Echinocereus triglochidiatus arizonicus*). The Arizona hedgehog cactus occurs at elevations of 3,700 to 5,000 feet. Elevations in the Project area ranges from 1,415 to 1,437 feet, which makes the occurrence of the listed species unlikely.

Comment No. 31 **Issue Code: 14**
The commentor raises an important issue. Title VI complaints about the subject plants were filed with EPA. As of November 2000 (last

Comment No. 31 (cont.) **Issue Code: 14**

update of status page), both of the Title VI complaints to the EPA were "Under Review" for possible investigation. This means that a complaint was received by the EPA, but no decision has yet been made on whether to reject the complaint because they did not meet regulatory requirements, accept the complaint for investigation, or refer the complaint to another Federal agency.

The commentor's assertion that "all hazardous waste facilities in Phoenix that accept hazardous waste generated off-site are all in low-income communities of color" is not substantiated by any documentation. Hazardous waste would be disposed of in accordance with all applicable regulations. While the proposed Project has no role in the siting or operating of the hazardous waste management facilities, it will be generating some waste that could be disposed of in the subject facilities. No quantification of the impacts of these facilities on surrounding minority or low-income populations has been made, so no calculation of the increase in impacts due to waste from the proposed Project can be made. However, it is evident that any disproportionate impacts to any minority or low-income populations from those facilities would be connected to a degree to the waste originating at Sundance. Thus, the proposed Project would have some disproportionate impact to minority or low-income populations around the subject waste disposal facilities should waste from Sundance be disposed of at either of the subject facilities.

Comment No. 32 **Issue Code: 05**

The DEIS states that spills or leaks of hazardous fluids (e.g., fuel, lubricants, chemicals, etc.) could contaminate the groundwater and affect aquifer use. The extent of the impacts would be minimized by restricting the location of hazardous materials storage, and immediate cleanup of spills and leaks. The procedures used for storage are discussed. In addition, the DEIS discusses the Sundance Project's collection of storm water. See Section 3.5.1.2, pages 3-20 of the DEIS.

Comment No. 32 (cont.) **Issue Code: 05**

During exploratory drilling on the proposed Property, a water bearing zone was not found until a depth of 270 feet. As part of the design of the proposed Facility, drains will be installed near all equipment with any probability of oil or fuel leaks. The drains will all flow to a water/oil separator in the event of a spill. Concrete containment structures will be constructed at the perimeter of this equipment to handle any sheet flow overflows. Concrete foundations and embankments will be constructed around the ammonia and fuel tanks designed to handle any overflow of the maximum amount of ammonia or fuel stored onsite at any time.

Comment No. 33 **Issue Code: 09**

The assessment of visual resources is subjective. What is highly valuable to one person may be of little consequence to others. In order to increase the objectivity of these assessments, methods have been developed that include factors that can be measured. These factors include points of view, numbers of people using these points of view, and prevalence of the type of resource in the area. These factors are used to determine existing character of the resource, the potential changes to the resource, and the number of people that would be affected. It is true that someone living close to the proposed Facility would have their individual view impacted to a greater degree than the general public.

The DEIS readily discloses that the proposed Facility would be apparent to viewers within three miles of the proposed Facility and would change the characteristic landscape around the proposed Facility. While the plume may be visible during cold mornings, the hot and dry climate conditions in Coolidge would lead to rapid evaporation of the plume during most of the year. The proposed Facility would be a simple-cycle generating facility, not a combined-cycle facility with cooling towers, and would not produce a large steam plume.

Comment No. 34 **Issue Code: 09**
Typically, wildlife species will avoid lighted areas unless lights attract a prey. Nocturnal insectivorous birds and bats would be attracted to insects that would be attracted to the lights at the proposed Facility. This would probably be a significant positive impact. Other, less tolerant wildlife would avoid the area.

Comment No. 35 **Issue Code: 11**
While the consultations were ongoing, preliminary discussions indicated no immediate problems. The results of the consultations to date have been included in the FEIS.

Comment No. 36 **Issue Code: 15**
Asphalt roads have been constructed for many years in the USA. Any short-term inconvenience of smelling asphalt fumes is overridden by the long-term effect of reducing road dust by paving roads. Only a 1.5 mile stretch of road would be paved allowing for a very short construction period over which any asphalt fumes would be present.

Comment No. 37 **Issue Code: 14**
The Environmental Justice section was prepared in accordance with Department of Energy and Council on Environmental Quality guidelines. These guidelines direct the comparison minority and low-income populations of the affected area with that of the larger overall region. The demographic composition of the local affected area (Census Tract 12) is comparable to that of the region. There were no disproportionate concentrations of minority or low-income populations evident from the census data. The unavoidable adverse human health impacts identified in the DEIS included air emissions, noise, and visual impacts. These impacts were assessed and would not disproportionately affect minority or low-income populations.

U.S. Department of the Interior
Denver, CO
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United States Department of the Interior

NATIONAL PARK SERVICE
Air Resources Division
P.O. Box 25287
Denver, CO 80225

IN REPLY REFER TO:

May 7, 2001

N3615 (2350)

Mr. John Holt, Environmental Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
Phoenix, Arizona 85005-6457

Dear Mr. Holt:

The Air Resources Division of the National Park Service (NPS) has reviewed the Draft Environmental Impact Statement (DEIS) for the Sundance Energy Project (Sundance) and offers these comments. This project would consist of a natural gas-fired simple cycle 600 MW power facility located southwest of Coolidge, Arizona. This site is located 75 km north-northwest of Saguaro National Park (NP), a federal Class I air quality area administered by the NPS. The Sundance facility would also be located 8 km south of Case Grande National Monument (NM), a Class II area administered by the NPS. The proposed project would consist of the construction and operation of an electric generating facility, construction of a 14-mile pipeline to supply natural gas to the proposed facility, the construction of a new double-circuit 230-kV transmission line, construction of a new single-circuit 230-kV transmission line, upgrade of the Signal Substation, and the addition of a 230-kV bay at the Coolidge Substation.

Based on the proposed emissions, the Sundance facility would exceed the Prevention of Significant Deterioration (PSD) applicability levels for nitrogen oxides, carbon monoxide, particulate matter, and volatile organic compounds. As a Federal Land Manager, the NPS is part of the PSD review and comment process for this project. The Sundance Energy PSD permit application is being processed by the Pinal County Air Quality Control District. The NPS is currently reviewing this PSD application and will be issuing additional comments regarding this project to the Pinal County Air Quality Control District. The comments presented in this letter are not to be considered the final comments of the NPS regarding this proposed project. Rather, this letter reflects only the comments of the NPS regarding this DEIS.

01/03

Comment No. 01 **Issue Code: 03**

The analysis of the proposed Facility indicates that the maximum ambient air impacts for all pollutants, and applicable averaging periods, were less than 4% of the NAAQS. See amended air quality in Section 4.2 in the FEIS and responses to Public Hearing Comment Nos. 05 and 08.

This EIS incorporates many elements of the PSD analysis, and this information is presented on pages 4-13 through 4-17. The air quality impact analysis to assess impacts at Saguaro NP was performed using the EPA CALPUFF model. Table 4-14 indicates that visibility impacts at Saguaro NP would not exceed the NPS significant impact threshold of a 5% change in background extinction. An acid deposition impact analysis for Saguaro NP is also presented. Based upon the change in extinction and annual deposition results presented in this DEIS, the NPS does not believe that this project will cause an adverse impact to air quality or related values at Saguaro NP. 02/03

However, the NPS notes that no information regarding potential air quality impacts at Casa Grande NM is presented in this DEIS. Under the Organic Act of 1916, the NPS is directed by Congress "to conserve the scenery and the natural and historical objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." Although classified as a Class II air quality area, the potential impacts that this proposed project may have on Casa Grande NM should be presented in this DEIS. Given the proximity of this proposed project to Casa Grande NM, such an analysis is vital to understanding the potential impacts associated with the proposed Sundance Energy Project. We request that visibility impact and acid deposition analyses be performed and the results included in the Final Environmental Impact Statement, and that any final decision regarding this proposed project be postponed until this information can be included in the decision-making process. 03/03

Although the DEIS does not present an assessment of potential air quality impacts at Casa Grande NM, the air quality sections that are included were very well done and thorough. We have also appreciated the regular updates and newsletters that were distributed as this document was prepared, and commend the Western Area Power Administration in their efforts to produce this document. If there are any questions regarding these comments, please feel free to contact me at (303) 969-2076. 04/03

Sincerely,

Don K. Codding

Don Codding
Environmental Protection Specialist
Policy, Planning and Permit Review Branch

cc:
Donald Gabrielson
Pinal County Air Quality Control District
P.O. Box 987
Florence, Arizona 85232

Comment No. 02 **Issue Code: 03**

Comment noted.

Comment No. 03 **Issue Code: 03**

At the request of the National Park Service for both the Sundance Energy PSD/Title V permit application and the Sundance Energy Environmental Impact Statement process, an Air Quality Related Values (AQRV) analysis was performed for the Casa Grande National Monument in Coolidge, approximately four miles north of the proposed Facility. The analysis was performed using the same CALPUFF/CALMET procedures described for the mandatory PSD AQRV analysis for the Class I Superstition Wilderness and the Saguaro West National Park.

The results of the analysis, shown in Table 1, demonstrate that the maximum visibility reduction is predicted to be 7.7% for one 24-hour period in February for the full year modeling analysis. Although one 24-period in February exceeded 5%, the next highest 24-hour visibility reduction in February was 2.75%. Therefore, according to the procedures developed by the Federal Land Managers (Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report, December 2000), the proposed Facility would not have an adverse effect on visibility at the Casa Grande National Monument.

Comment No. 03 (cont.) **Issue Code: 03**

Table 1
Visibility Impacts at Casa Grande National Monument

Month	Maximum 24-Hour Visibility Reduction (%)
January	2.81
February	7.73 – next highest 2.75
March	3.98
April	3.88
May	4.05
June	2.43
July	1.66
August	2.02
September	3.11
October	1.73
November	2.66
December	3.69

In addition to a visibility analysis, acid deposition (wet and dry) of sulfur and nitrogen was also calculated at the Casa Grande National Monument using the procedures described in the aforementioned FLAG document. The results of the analysis are shown in Table 2.

Table 2
Deposition at Casa Grande National Monument

Month	Maximum 24-Hour Deposition (kilograms/hectare)	
	Nitrogen	Sulfur
January	0.00723	0.00059
February	0.00413	0.00040
March	0.00227	0.00029
April	0.00131	0.00025
May	0.00117	0.00014
June	0.00364	0.00024
July	0.00253	0.00028
August	0.00300	0.00041
September	0.00537	0.00042
October	0.00031	0.00005
November	0.00284	0.00022
December	0.00169	0.00013

Comment No. 04 **Issue Code: 03**

Comment noted.

United States Department of the Interior
San Francisco, CA
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United States Department of the Interior

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600 Harrison Street, Suite 515
San Francisco, California 94107-1376

April 30, 2001

ER 01/199

Mr. John Holt, Environmental Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
Phoenix, AZ 85005-6457

Dear Mr. Holt:

The Department of the Interior has reviewed the Draft Environmental Impact Statement (EIS) for the Sundance Energy Project, Pinal County, AZ, and has no comments to offer.

Thank you for the opportunity to review this document.

Sincerely,

Patricia Sanderson Port
Regional Environmental Officer

cc:
Director, OEPC, w/original incoming
Regional Director, FWS, Albuquerque

No comments.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

May 7, 2001

Mr. John Holt
Environmental Manager
Western Area Power Administration
Desert Southwest Region
P.O. Box 6457
Phoenix, AZ 85005-6457

Dear Mr Holt:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the **Sundance Energy Project, Pinal County, Arizona** (CEQ # 010090). Our review and comments are pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

Sundance Energy LLC (Sundance) has applied to the Western Area Power Administration (Western) to interconnect a planned generator facility to Western's transmission system in the vicinity of Coolidge, Arizona in Pinal County, southwest of Phoenix. The proposed Federal action is acceptance of the application and an interconnection and construction agreement with Sundance. Since construction of the generator facility is a connected action (40 CFR 1508.25(a)(1)) to the decision whether to allow Sundance to interconnect to Western's transmission system, the EIS evaluates the proposed power plant project as well as the interconnection.

Sundance proposes to construct and operate the Sundance Energy Project (Project), a 600- megawatt (MW) natural gas-fired, simple-cycle power plant on private lands southwest of Coolidge. The proposed Project would consist of the natural gas-fired power plant and associated infrastructure, newly constructed and upgraded existing transmission lines, a pipeline to supply additional natural gas, a water supply well, and access roads. The Project would provide energy when it is needed during peak demand periods in the region. It would also be a "merchant plant" which means it is not owned by a public utility.

The DEIS evaluates the No Action alternative where Western would reject the Sundance application to interconnect to Western's transmission system, the proposed Project, and three different transmission line route alignments.

EPA acknowledges the need to supply additional electricity to the rapidly growing Phoenix region. We advocate an energy development approach which assures a long-term,

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sustainable balance between available energy supplies, energy demand, and protection of ecosystems and human health. EPA believes that the goals of providing additional energy supplies, aggressive energy conservation, and diversification of energy supply sources should be carefully balanced.

While we support efforts to meeting growing energy demands, we have concerns regarding the availability of process water, the storage and use of wastewater, potentially significant air quality impacts, and consultation with Indian Tribal Governments (see Detailed Comments). Because of the above concerns, we have rated the proposed project and DEIS as EC-2, Environmental Concerns - Insufficient Information (see attached "Summary of the EPA Rating System").

We appreciate the opportunity to review this DEIS. Please send two (2) copies of the final environmental impact statement to this office at the same time it is officially filed with our HQ Office of Federal Activities. If you have any questions, please call Ms. Laura Fujii, of my staff, at 415-744-1601, email: fujii.laura@epa.gov.

Sincerely,

Lisa B. Hanf, Manager
Federal Activities Office

File: sundancedeis.wpd
Main ID# 003492
Enclosure: Detailed Comments (9 pages)
Summary of the EPA Rating System
Executive Order on Consultation and Coordination with Indian Tribal Governments

cc: Carol Borgstrom, DOE
US Corps of Engineers
Donald Gabrielson, Pinal Air Quality Stationary Sources
Arizona Department of Environmental Quality
Don Spencer, Casa Grande National Monument
Donald Antone, Gila River Indian Community
Ivan Makil, Salt River Pima-Maricopa Indian Community
Edward Manuel, Tohono O'odham Nation
Raymond Stanley, San Carlos Apache Tribe

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01/17

Comment No. 01 **Issue Code: 17**

These comments are the summary of the detailed comments that follow. The responses are provided for each detailed comment. For responses to comments on availability of process water see responses to Comment Nos. 07, 08, and 09. For responses to comments on storage and use of wastewater see responses to Comment Nos. 06, 07, 10, and 12. For responses to comments on potentially significant air impacts see responses to Comment Nos. 17, 18, and 19. For responses to comments on consultation with Indian Tribal Governmental see response to Comment No. 20.

DEIS COMMENTS, WAPA, SUNDANCE ENERGY PROJECT, AZ, MAY 2001

DETAILED COMMENTS

Water Resources

1. Sundance proposes to use demineralized Central Arizona Project (CAP) water for process/makeup water and then blend the pretreatment and power plant wastewater with untreated CAP water for irrigation of nearby agricultural lands (pg. 2-10). In order to use reclaimed wastewater in this manner, Sundance must apply for an Arizona reclaimed wastewater reuse permit which would allow use of reclaimed wastewater for irrigation for 5 years. If a permanent on-site demineralizer system is used, the regeneration wastewater would also be combined with the pretreatment wastewater and untreated CAP water for use in irrigation. The Draft Environmental Impact Statement (DEIS) states that potential impacts of irrigating with reclaimed wastewater would be the same as the current impacts of irrigating with raw CAP water because the wastewater would be blended to bring the total dissolved solids down to the level found in raw CAP water. 02/07

EPA is concerned with the long-term use of the wastewater for agricultural use, given the potential for it to contain constituents such as perchlorate, arsenic, radioactives, nutrients, and mercury. For instance, recent studies have indicated that perchlorate may affect hormone production in infants. Thus, increased use of reclaimed wastewater for domestic use or irrigated agriculture (especially of food crops) should be carefully considered and evaluated. 03/07

Recommendations:
The Final Environmental Impact Statement (FEIS) should provide a more thorough evaluation and description of potential impacts of irrigating with reclaimed wastewater. For example, describe the probable concentrations of perchlorate, arsenic and other contaminants in reblended wastewater (e.g., would the concentrations really be the same as untreated raw CAP water?) and the potential human health and environmental effects. The high salinity of Colorado River water and the adverse affect on long-term soil viability is also well known. The FEIS should evaluate the ability to sustain irrigation with reclaimed wastewater, given historical problems of increasing soil salinity and water logging in the arid West. The FEIS should briefly describe the requirements to obtain the reclaimed wastewater reuse permits (pg. 4-29), such as the allowable wastewater constituent levels, what crops can be irrigated with reclaimed wastewater, and other wastewater reuse options. 03/07 (cont.) 04/07 05/07

2. The DEIS states that the water quality of the wastewater retention pond and process/makeup water storage pond is expected to be compatible with waterfowl use (pg. 2-11). Waterfowl use of these ponds, especially of the wastewater retention pond, is of concern because the wastewater and sludge would contain higher concentrations of CAP water constituents and possible contaminants from processing use (pg. 4-29). These contaminants could include perchlorate, arsenic, radioactives, nutrients, and mercury. 06/09

1

Comment No. 02 **Issue Code: 07**
Correct. Sundance has applied for a Reclaimed Water Use Permit and an Aquifer Protection Individual Permit. The Reclaimed Water Use Permit requires discussion of the source of reclaimed water for direct reuse; flow rate; volumes; description of the direct reuse activity; Standard Industrial Code (SIC) classification; chemical, physical and biological characteristics; and types of crops to which reclaimed water will be applied.

The Aquifer Protection Individual Permit requires documentation of the Facility Site Plan including facility location; structures; property lines; all wells; facility design documents; proposed facility discharge point(s) of compliance (POCs); activities description of the BADCT to be employed; hydrogeologic study; and a proposal for monitoring, compliance, and closure/post-closure activities.

The Aquifer Protection Individual Permit takes into account the use of adjacent properties, and all known wells within one-half mile including water wells, injection wells, drywells, and their uses. The Permit requires development of a Contingency Plan, with contingency responses and corrective actions. A summary of the Wastewater Reuse Permit Requirements is attached at the end of the Appendix C.

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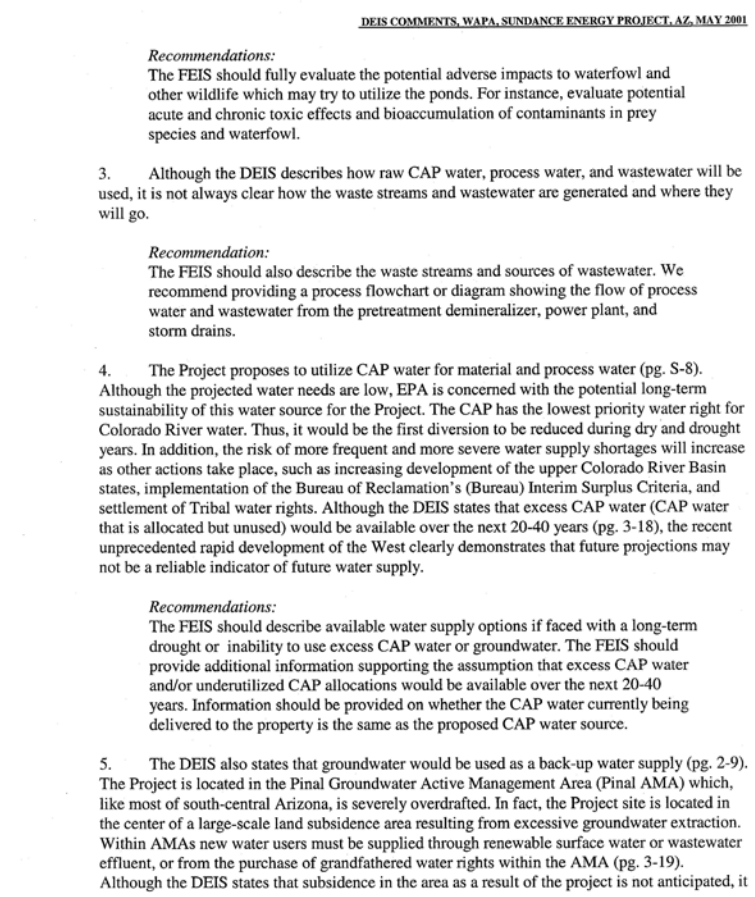
Comment No. 03 **Issue Code: 07**
A summary of the Wastewater Reuse Permit Requirements is attached at the end of Appendix C.

Comment No. 04 **Issue Code: 07**
The two groundwater wells on the proposed Property have been historically used for irrigation of crops. Typical TDS values of this groundwater source have been near 2,700 mg/L. Sundance would mostly use CAP water to operate the proposed Facility. Wastewater from the water treatment facilities on the proposed Site would be



DEIS COMMENTS, WAPA, SUNDANCE ENERGY PROJECT, AZ, MAY 2001

Recommendations:
The FEIS should fully evaluate the potential adverse impacts to waterfowl and other wildlife which may try to utilize the ponds. For instance, evaluate potential acute and chronic toxic effects and bioaccumulation of contaminants in prey species and waterfowl.

06/09 (cont.)

3. Although the DEIS describes how raw CAP water, process water, and wastewater will be used, it is not always clear how the waste streams and wastewater are generated and where they will go.

07/20

Recommendation:
The FEIS should also describe the waste streams and sources of wastewater. We recommend providing a process flowchart or diagram showing the flow of process water and wastewater from the pretreatment demineralizer, power plant, and storm drains.

4. The Project proposes to utilize CAP water for material and process water (pg. S-8). Although the projected water needs are low, EPA is concerned with the potential long-term sustainability of this water source for the Project. The CAP has the lowest priority water right for Colorado River water. Thus, it would be the first diversion to be reduced during dry and drought years. In addition, the risk of more frequent and more severe water supply shortages will increase as other actions take place, such as increasing development of the upper Colorado River Basin states, implementation of the Bureau of Reclamation's (Bureau) Interim Surplus Criteria, and settlement of Tribal water rights. Although the DEIS states that excess CAP water (CAP water that is allocated but unused) would be available over the next 20-40 years (pg. 3-18), the recent unprecedented rapid development of the West clearly demonstrates that future projections may not be a reliable indicator of future water supply.

08/07

Recommendations:
The FEIS should describe available water supply options if faced with a long-term drought or inability to use excess CAP water or groundwater. The FEIS should provide additional information supporting the assumption that excess CAP water and/or underutilized CAP allocations would be available over the next 20-40 years. Information should be provided on whether the CAP water currently being delivered to the property is the same as the proposed CAP water source.

5. The DEIS also states that groundwater would be used as a back-up water supply (pg. 2-9). The Project is located in the Pinal Groundwater Active Management Area (Pinal AMA) which, like most of south-central Arizona, is severely overdrafted. In fact, the Project site is located in the center of a large-scale land subsidence area resulting from excessive groundwater extraction. Within AMAs new water users must be supplied through renewable surface water or wastewater effluent, or from the purchase of grandfathered water rights within the AMA (pg. 3-19). Although the DEIS states that subsidence in the area as a result of the project is not anticipated, it

09/07

2

Comment No. 04 (cont.) **Issue Code: 07**

blended with the CAP water before any application for irrigation purposes. Water applied for irrigation would have a resultant TDS similar to levels found in the groundwater. Amended Table 4-17 in Section 4.5 of the FEIS shows the comparison of the wastewater before and after blending and the groundwater.

Chloride levels in the blended wastewater would be approximately 300 mg/L. This level would be below the current groundwater chloride levels of approximately 735 mg/L that have been applied to crops. The blended wastewater chloride level would be slightly above the Federal Secondary Maximum Contaminant Level of 250 mg/L for drinking water (40 CFR Part 143.3).

The blended wastewater that would be applied to adjacent crops represents a fraction of the irrigation water that would be applied to the crops. Since the TDS and chloride levels would be less than the groundwater that has historically been applied to these crops, the probability of salinity buildup would decreased for these crops. According to the landowner whose crops would be irrigated by the blended wastewater, a larger portion of the water for irrigation would be supplied by CAP water. Furthermore, flood irrigation would be applied periodically to these crops to leach salts from the soils. The blending procedures and the final water quality required for irrigation purposes would by law be in compliance with the Reclaimed Wastewater Reuse Permit issued and administered by the Arizona Department of Environmental Quality in accordance with the Arizona Administrative Code R18-9-701 through 707.

The historical problems of waterlogging have reduced and even reversed in the vicinity of the proposed Project in recent years. The ADWR, in its November 30, 2000 Memorandum, notes the dramatic rise in the local water table in recent years as follows: *"Since the mid-1980s, water levels in the area around the proposed plant site have*

does not describe the groundwater permitting process or whether long-term use of groundwater is feasible. Again, the use of groundwater over an extended period of time is of concern given the already severely overdrafted aquifer and the tight regulatory control of groundwater withdrawals.

Recommendations:
Given the above regulatory framework for the AMA, it is not clear how feasible it is to use groundwater as a long-term backup supply. The lack of a reliable back-up water supply is a concern given the potential unreliability of a long-term CAP supply. The EIS should describe the actions being taken to obtain the permit for groundwater use and options to use if groundwater is not feasible as a backup.

09/07 (cont.)

6. The Project facility will store wastewater in a lined pond and untreated CAP process/makeup water in an unlined 10-acre pond. Pretreated demineralized CAP process/makeup water would be stored in a water tank. The Project area is semi-arid which could result in significant water loss due to evaporation and percolation from the unlined pond.

Recommendations:
Given the semi-arid location and high potential loss of raw makeup water from evaporation or percolation, we suggest consideration of pond lining or other storage options to help minimize loss of raw process water. Although less than 1,000 acre-feet per year (af/yr) of process water would be required (pg. 2-8), the arid conditions and scarcity of reliable water supplies should dictate efforts to conserve, minimize water loss, and maximize effective use of this scarce resource. At a minimum, the FEIS should include information on the potential amount of evaporation or percolation loss from the water storage ponds.

10/20

7. The wastewater retention pond would be designed for a 20-year period and constructed and operated in accordance with the Arizona standards for Best Available Demonstrated Control Technology (pg. 4-23). In addition, the pond would be constructed with adequate storage to contain plant wastewater during a 100-year 24-hour storm event (pg. 2-11).

Recommendations:
FEIS should provide a short description of the Best Available Demonstrated Control Technologies that would be used. For example, describe the reliability of the proposed liner and whether the proposed sizing of the pond is the industry standard for this region. The FEIS should also include a short description of emergency response plans in the event of stormwater overflow or unauthorized discharge from the wastewater retention pond.

11/07

12/07

8. Stormwater would drain by gravity to an unlined stormwater collection impoundment for retention on-site until the water either percolates into the ground or evaporates (pg. 2-11). EPA is concerned with the potential water quality of the stormwater due to the potential for collection of

13/07

3

Comment No. 04 (cont.) **Issue Code: 07**
risen by as much as 120 feet." Groundwater use by the proposed Project, in the worst case scenario of total groundwater use, is anticipated to only slightly decrease the rate of water table recovery.

Comment No. 05 **Issue Code: 07**
Sundance has applied for a Reclaimed Water Use Permit and an Aquifer Protection Individual Permit. The Reclaimed Water Use Permit requires discussion of the source of reclaimed water for direct reuse; flow rate; volumes; description of the direct reuse activity; Standard Industrial Code (SIC) classification; chemical, physical and biological characteristics; and types of crops to which reclaimed water will be applied.

The Aquifer Protection Individual Permit requires documentation of the Facility Site Plan including facility location; structures; property lines; all wells; facility design documents; proposed facility discharge point(s) of compliance (POCs); activities description of the BADCT to be employed; hydrogeologic study; and a proposal for monitoring, compliance, and closure/post-closure activities.

The Aquifer Protection Individual Permit takes into account the use of adjacent properties, and all known wells within one-half mile including water wells, injection wells, drywells, and their uses. The Permit requires development of a Contingency Plan, with contingency responses and corrective actions. A summary of the Wastewater Reuse Permit Requirements is attached at the end of the Appendix C.

Comment No. 06 **Issue Code: 09**
The issue was raised concerning the effect on birds and animals if they would drink the water in the wastewater pond. The water quality in the wastewater pond would have a range of constituents. Wastewater results from the purification of the CAP water by

oils and other contaminants in the Facility area. We are also concerned with the potential use of the stormwater impoundment by waterfowl and wildlife and associated wildlife impacts. 13/07 (cont.)

Recommendations:
FEIS should describe the probable water quality of stormwater, its potential impacts to wildlife or to surface waters in the event of unintentional discharges or overflows from the collection impoundment. We recommend use of oil/water separators and other technology to reduce the contaminants in stormwater prior to allowing it to percolate into the groundwater. The FEIS should describe stormwater permit requirements, if any, and include a summary of the spill prevention countermeasure and control plan. 14/07 15/07

9. The proposed pipelines will cross dry washes classified as waters of US and state waters, thus Sundance will need to consult with the US Corps of Engineers (COE) and Arizona Department of Environmental Quality (ADEQ) regarding potential impacts to these waters (pg. 3-23). 16/07

Recommendations:
The FEIS should describe the status of consultations with the COE and ADEQ and whether a wetland delineation has been conducted. The description should state whether a Clean Water Act Section 404 Permit or stream disturbance permit will be required.

Air Quality

1. The DEIS states that the Project would be a major source for nitrous oxides (NO_x) and carbon monoxide (CO) pursuant to Prevention of Significant Deterioration (PSD) air quality requirements. This is of concern given the proximity to the rapidly developing Phoenix region and its increasing air quality problems. The results of the PSD Class II increment analysis indicate that the maximum impact from all sources is predicted to increase from 5.08 ug/m^3 to 5.14 ug/m^3 for turbine configuration 1. This would represent 21% of the NO_2 PSD Class II increment of 25ug/m^3 (pg. 4-15). The maximum impact from all sources is predicted to increase from 2.83 ug/m^3 to 2.89 ug/m^3 for turbine configuration 2, a NO_2 PSD Class II increment consumption of 11.56%.

Recommendations:
The FEIS should include a description of PSD permit requirements, process, and the status of the PSD permit for the Project. EPA provides assistance and oversight of the PSD program as administered by Pinal County. Questions or requests for assistance from EPA may be directed to Ginger Vagenas, Air Permits Office, Air Division, Region 9 EPA, 415-744-1252. 17/03

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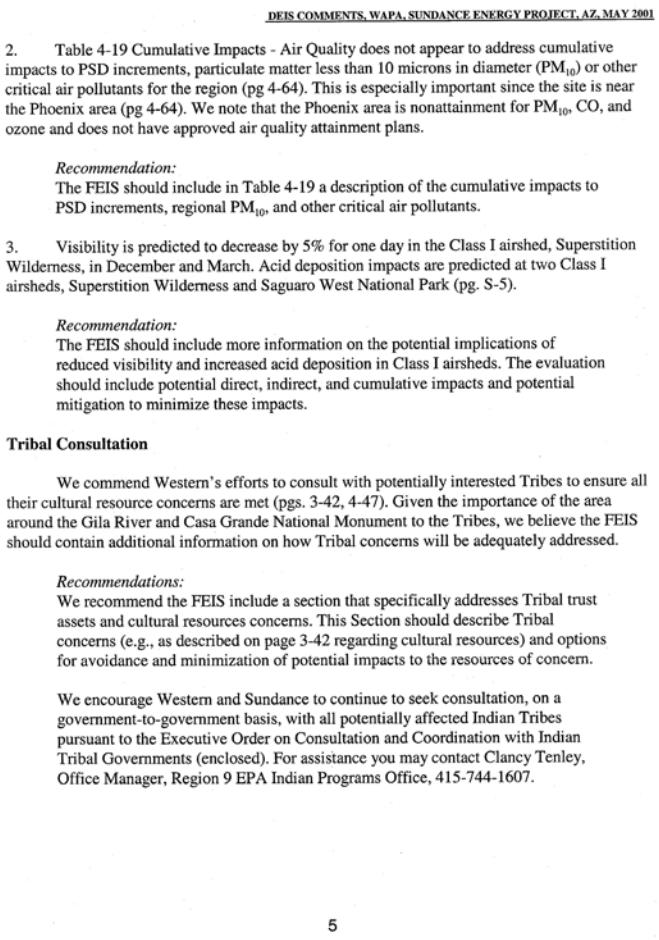
Comment No. 06 (cont.) **Issue Code: 09**

Reverse Osmosis. The purified water would be misted into the turbines to increase intake air mass. The Reverse Osmosis process would concentrate constituents already in CAP water.

The wastewater released from the Reverse Osmosis process would be highest in constituents as it enters the wastewater pond. The wastewater would then be blended with unprocessed CAP water. This blending would reduce the levels of constituents in the blended water to approximately the constituent levels of the groundwater from wells onsite. The blended water would be released for irrigation on the alfalfa and cotton crops on or near the proposed Property. Amended Table 4-17 in Section 4.5 of the FEIS shows the comparison of groundwater and wastewater before and after blending.

Of the constituents in the wastewater, chloride, iron, magnesium, manganese, sulfate, and TDS would be above the National Secondary Drinking Water regulations. Of these constituents, only iron would be above the level present in the groundwater while the manganese concentration would be the same. Iron mostly causes a color and taste problem in water. While TDS levels in the blended wastewater would be above secondary drinking standards, the levels would be below the groundwater currently being applied to adjacent crops.

Arsenic levels were expressed as a potential concern. CAP water quality data were obtained from a proprietary source in Phoenix that records daily CAP water quality before inflow to a water treatment facility. Arsenic levels are measured monthly. From 1996 through 2000, arsenic levels in CAP water were measured 82 times. The maximum arsenic concentration was 6.6 ppb and the average concentration was 3.1 ppb. The maximum arsenic levels could increase to 32.5 ppb, a value 60% of the standard established for drinking water (40 CFR Part 141.11).



DEIS COMMENTS, WAPA, SUNDANCE ENERGY PROJECT, AZ, MAY 2001

2. Table 4-19 Cumulative Impacts - Air Quality does not appear to address cumulative impacts to PSD increments, particulate matter less than 10 microns in diameter (PM_{10}) or other critical air pollutants for the region (pg 4-64). This is especially important since the site is near the Phoenix area (pg 4-64). We note that the Phoenix area is nonattainment for PM_{10}, CO, and ozone and does not have approved air quality attainment plans. 18/03

Recommendation:
The FEIS should include in Table 4-19 a description of the cumulative impacts to PSD increments, regional PM_{10}, and other critical air pollutants.

3. Visibility is predicted to decrease by 5% for one day in the Class I airshed, Superstition Wilderness, in December and March. Acid deposition impacts are predicted at two Class I airsheds, Superstition Wilderness and Saguaro West National Park (pg. S-5). 19/03

Recommendation:
The FEIS should include more information on the potential implications of reduced visibility and increased acid deposition in Class I airsheds. The evaluation should include potential direct, indirect, and cumulative impacts and potential mitigation to minimize these impacts.

Tribal Consultation

We commend Western's efforts to consult with potentially interested Tribes to ensure all their cultural resource concerns are met (pgs. 3-42, 4-47). Given the importance of the area around the Gila River and Casa Grande National Monument to the Tribes, we believe the FEIS should contain additional information on how Tribal concerns will be adequately addressed. 20/10

Recommendations:
We recommend the FEIS include a section that specifically addresses Tribal trust assets and cultural resources concerns. This Section should describe Tribal concerns (e.g., as described on page 3-42 regarding cultural resources) and options for avoidance and minimization of potential impacts to the resources of concern. 21/10

We encourage Western and Sundance to continue to seek consultation, on a government-to-government basis, with all potentially affected Indian Tribes pursuant to the Executive Order on Consultation and Coordination with Indian Tribal Governments (enclosed). For assistance you may contact Clancy Tenley, Office Manager, Region 9 EPA Indian Programs Office, 415-744-1607. 22/10

5

Comment No. 06 (cont.) **Issue Code: 09**

The water quality in the wastewater pond could be compared to the Arizona Aquatic Life and Wildlife standards (AAC Title 18, Chapter 11, Article 1, Appendix A, Table 1) for effluent dependent waters, of which the water quality meets for the constituents analyzed. The constituents that would be found in the wastewater have no numeric standard under this classification and therefore, are not considered injurious to wildlife. Of the constituents for which there is a standard, it's not likely that they'll be present in the wastewater, based on knowledge of the influent water quality and the industrial process.

The blended wastewater would be used for irrigation of crops and/or pasture on the existing fields located on the proposed Property. Since Sundance would use blended wastewater for irrigation purposes, they must apply for a Reclaimed Wastewater Reuse Permit. Some examples of reclaimed wastewater reuse facilities in Arizona include farms, golf courses, and parks. These rules are officially identified as Article 7 - Regulations for the Reuse of Wastewater, and are numbered as A.A.C. R18-9-701 through 707. Reclaimed Wastewater Reuse Permits are legally binding documents that authorize a permittee to use reclaimed wastewater for irrigation for a period of five years according to rules adopted on May 24, 1985.

The Arizona Field Office of the U.S. Fish and Wildlife Service uses water quality standards for Aquatic Life and Wildlife as their guidance for the protection of waterfowl. ADEQ concurred with the analysis of wastewater impacts on waterfowl. Therefore, the estimates of the constituents in the wastewater pond would pose no threat to waterfowl or wildlife. However, Sundance would commit to monitoring waterfowl use of the wastewater pond in coordination with the Arizona Department of Fish and Game. If adverse health events are observed, Sundance would coordinate with the Arizona Department of Fish and Game to develop mitigation.

Electric and Magnetic Field Effects

The DEIS states that there is potential for induced currents in the pipelines from the high-voltage transmission lines and references Section 4.4.3.2 Electric and Magnetic Field Effects (pg. 4-25) within the discussion of transmission line effects (Section 4.4.3). However, the discussion of induced currents in Section 4.4.3.2 does not even mention pipelines or the actual risk of induced currents in these structures (pg. 4-26).

Recommendations:
The FEIS should fully describe and evaluate the potential for induced currents in the pipelines, the consequences and effects of induced currents in the pipelines, and describe mitigation proposed to minimize these effects. For instance, describe whether the pipelines would be grounded and whether grounding or exposure to transmission lines would pose a risk of explosion or other adverse effect on the natural gas pipeline. We understand that high-voltage transmission lines would be placed high above objects to reduce the potential for electric shocks (pg. 4-26). However, it is not clear whether this requirement would be sufficient to reduce problems regarding induced currents in the pipelines.

23/06

Hazardous Material Management

The DEIS indicates that there is a potential contamination hazard from the storage and use of hazardous material (S-7). These impacts would be minimized by restricting refueling activities from dry washes and by requiring immediate cleanup of spills and leaks. In addition, containment structures would be placed around the base of oil-filled equipment to contain spills at the electrical substations (pg. 2-24). It is not clear from these descriptions whether there will be containment structures around sources of potential hazardous material, if any, at the generating facility.

24/05

Recommendation:
The FEIS should describe how hazardous material will be handled and managed at the generating facility. We recommend the FEIS include a summary of the updated oil spill contingency plan and the Spill Prevention Countermeasure and Control (SPCC) plan.

25/05

26/05

Cumulative Impacts Analysis

Table 4-19 Cumulative Impacts (pg. 4-64). Although the DEIS states that the cumulative effects of other anticipated projects and activities were considered, only two energy projects, the Coolidge-Rogers Transmission Line Upgrade and the All American Pipeline project are evaluated.

27/05

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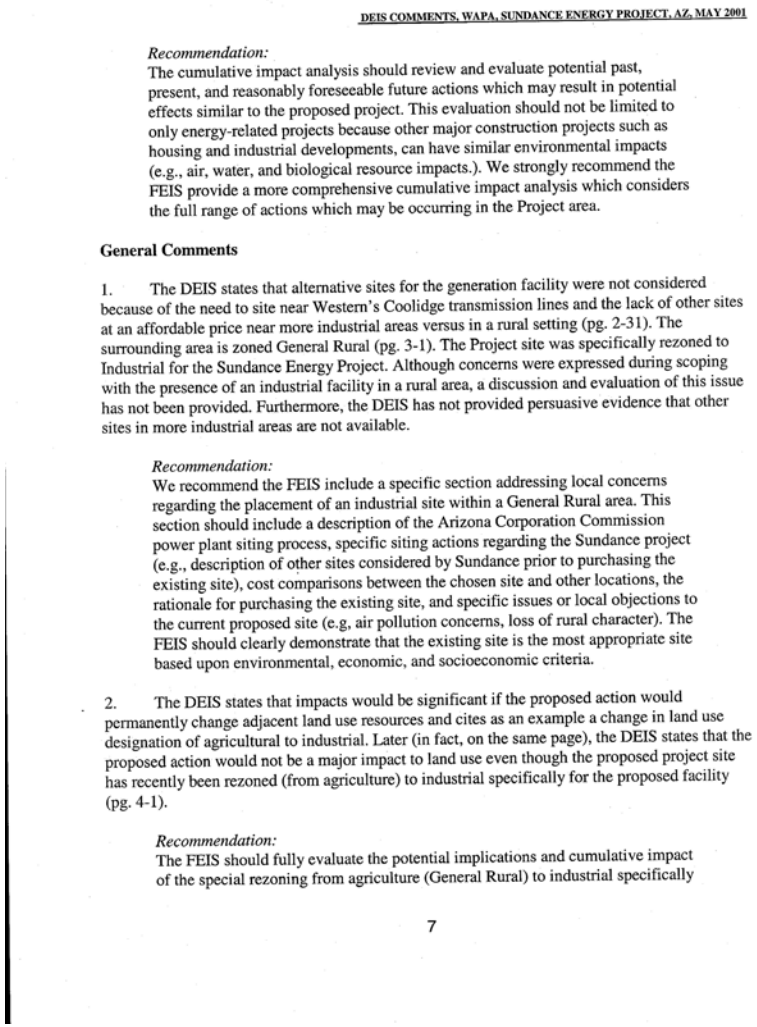
Comment No. 07 **Issue Code: 20**

Figure 2-4 on page 2-13 and Figure 2-5 on page 2-14 of the DEIS present the flow and estimated quantity of water flowing through the Facility processes. CAP water would be diverted from the Hohokam Irrigation District ditch and stored in a holding pond. The majority of the water would then be pumped through the demineralization/purification system where four-fifths would be used in the turbine misters and one-fifth would become wastewater concentrated with constituents (see response to Comment No. 06 above). The wastewater would then be pumped to the wastewater pond. The remaining CAP water from the holding tank would be pumped and blended with the wastewater in the wastewater pond. Water from the oil/water separators would also be sent to the wastewater pond.

Comment No. 08 **Issue Code: 07**

The Central Arizona Water Conservation District (CAWCD), in conjunction with the United States Bureau of Reclamation, has conducted numerous surveys and analyses of projected future availability of CAP water. The most recent analyses were presented to the Board of Directors of CAWCD on March 8, 200l. The data are extensive and may be reviewed by contacting Mr. Larry Dozier at CAP headquarters, 23636 North 7th Street, Phoenix, AZ, 85024. Summary conclusions presented to the Board of Directors reflect anticipated reliable availability of "excess" CAP water, i.e., water not delivered under long-term subcontracts and/or Indian/Federal allocations, in quantities varying from approximately one million acre feet per year in 2002, to 300,000 acre feet per year in 2030.

Additionally, Sundance is in negotiations to backup the "excess" CAP water contract currently offered by CAWCD with a firming contract from a long-term CAP water subcontractor for CAP water delivered from the "non-excess" or "long-term contract water" component of the CAP supplies. The proposed Project water requirement, in the extreme cases, would require less than



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Recommendation:
The cumulative impact analysis should review and evaluate potential past, present, and reasonably foreseeable future actions which may result in potential effects similar to the proposed project. This evaluation should not be limited to only energy-related projects because other major construction projects such as housing and industrial developments, can have similar environmental impacts (e.g., air, water, and biological resource impacts.). We strongly recommend the FEIS provide a more comprehensive cumulative impact analysis which considers the full range of actions which may be occurring in the Project area.

General Comments

1. The DEIS states that alternative sites for the generation facility were not considered because of the need to site near Western's Coolidge transmission lines and the lack of other sites at an affordable price near more industrial areas versus in a rural setting (pg. 2-31). The surrounding area is zoned General Rural (pg. 3-1). The Project site was specifically rezoned to Industrial for the Sundance Energy Project. Although concerns were expressed during scoping with the presence of an industrial facility in a rural area, a discussion and evaluation of this issue has not been provided. Furthermore, the DEIS has not provided persuasive evidence that other sites in more industrial areas are not available.

Recommendation:
We recommend the FEIS include a specific section addressing local concerns regarding the placement of an industrial site within a General Rural area. This section should include a description of the Arizona Corporation Commission power plant siting process, specific siting actions regarding the Sundance project (e.g., description of other sites considered by Sundance prior to purchasing the existing site), cost comparisons between the chosen site and other locations, the rationale for purchasing the existing site, and specific issues or local objections to the current proposed site (e.g, air pollution concerns, loss of rural character). The FEIS should clearly demonstrate that the existing site is the most appropriate site based upon environmental, economic, and socioeconomic criteria.

2. The DEIS states that impacts would be significant if the proposed action would permanently change adjacent land use resources and cites as an example a change in land use designation of agricultural to industrial. Later (in fact, on the same page), the DEIS states that the proposed action would not be a major impact to land use even though the proposed project site has recently been rezoned (from agriculture) to industrial specifically for the proposed facility (pg. 4-1).

Recommendation:
The FEIS should fully evaluate the potential implications and cumulative impact of the special rezoning from agriculture (General Rural) to industrial specifically

7

28/24

29/01

30/01

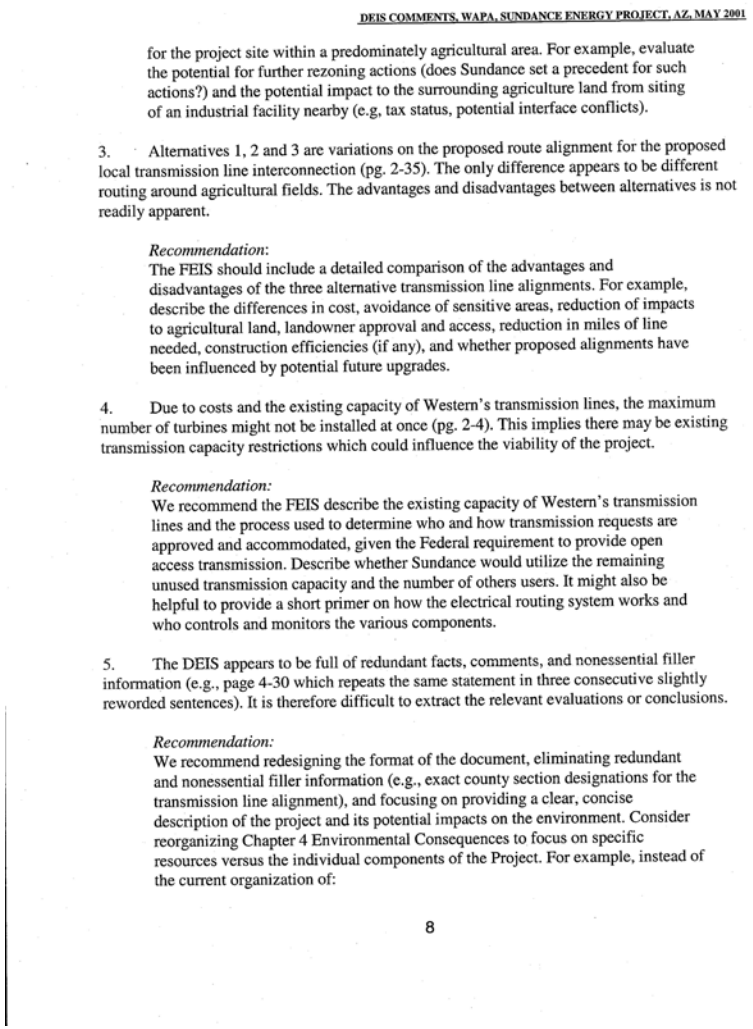
31/01

Comment No. 08 (cont.) **Issue Code: 07**

1,000 acre feet, or less than 0.3 % of the projected excess water after 30 years. Nevertheless, even assuming no CAP water were available, the hydrologic studies conducted for the proposed Project has shown that complete reliance on groundwater for a period of 40 years, well beyond the projected proposed Project life, would have minimal impact on the very extensive local aquifer, which is experiencing dramatic recovery from historical overdrafting. AWDR has reviewed these studies and has concurred with the findings of no impact on groundwater.

While the "no groundwater" scenario is not expected to occur during the projected life of the proposed Project, the magnitude of the aquifer involved is large and the proposed Project has the economic ability to pump from depths that are not economically feasible for the agricultural irrigators, the major competing pumpers in the region. If however, "no CAP water and no groundwater" scenario were to occur, then the proposed Project plan would be to not operate unless a suitable secure source of water is available. For example, the City of Coolidge sewage treatment facility effluent discharge is located a few miles north of the proposed Facility and might be suitable. Use of such effluent is not, however, currently being considered.

The proposed Facility would be a merchant wholesale generator, not selling to end user customers. End user customers would not be relying exclusively on generation from the proposed Facility, which would be interconnected into the integrated power grid, with extensive and multiple generation sources. As a simple cycle peaking facility, the proposed Project is not anticipated to generate electricity during periods when demand is substantially reduced and/or serviceable by more cost-efficient combined cycle facilities. If the proposed Project were to lose all of its primary and backup water supply, such a complete loss of water would not likely occur instantly nor unexpectedly. If it did occur due to sustained catastrophic drought



DEIS COMMENTS, WAPA, SUNDANCE ENERGY PROJECT, AZ, MAY 2001

for the project site within a predominately agricultural area. For example, evaluate the potential for further rezoning actions (does Sundance set a precedent for such actions?) and the potential impact to the surrounding agriculture land from siting of an industrial facility nearby (e.g, tax status, potential interface conflicts). 31/01 (cont.)

3. Alternatives 1, 2 and 3 are variations on the proposed route alignment for the proposed local transmission line interconnection (pg. 2-35). The only difference appears to be different routing around agricultural fields. The advantages and disadvantages between alternatives is not readily apparent.

Recommendation:
The FEIS should include a detailed comparison of the advantages and disadvantages of the three alternative transmission line alignments. For example, describe the differences in cost, avoidance of sensitive areas, reduction of impacts to agricultural land, landowner approval and access, reduction in miles of line needed, construction efficiencies (if any), and whether proposed alignments have been influenced by potential future upgrades. 32/21

4. Due to costs and the existing capacity of Western's transmission lines, the maximum number of turbines might not be installed at once (pg. 2-4). This implies there may be existing transmission capacity restrictions which could influence the viability of the project. 33/17

Recommendation:
We recommend the FEIS describe the existing capacity of Western's transmission lines and the process used to determine who and how transmission requests are approved and accommodated, given the Federal requirement to provide open access transmission. Describe whether Sundance would utilize the remaining unused transmission capacity and the number of others users. It might also be helpful to provide a short primer on how the electrical routing system works and who controls and monitors the various components. 34/17 35/17

5. The DEIS appears to be full of redundant facts, comments, and nonessential filler information (e.g., page 4-30 which repeats the same statement in three consecutive slightly reworded sentences). It is therefore difficult to extract the relevant evaluations or conclusions.

Recommendation:
We recommend redesigning the format of the document, eliminating redundant and nonessential filler information (e.g., exact county section designations for the transmission line alignment), and focusing on providing a clear, concise description of the project and its potential impacts on the environment. Consider reorganizing Chapter 4 Environmental Consequences to focus on specific resources versus the individual components of the Project. For example, instead of the current organization of: 36/25

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Comment No. 08 (cont.) **Issue Code: 07**

and concomitant total dewatering of the groundwater aquifer, then the proposed Project would not generate electricity during that period. Sundance would have to absorb the economic risk of this period. The baseload power availability of the region would not be affected by ceasing operations at the proposed Project. However, such a drought would probably affect the baseload power producers as well as result in an overall power shortage in the region.

All CAP water deliveries, whether for agricultural or municipal and industrial uses, come from the same source and system, originating at the Colorado River. This water is taken from Lake Havasu, and delivered through canals, lift stations, and regulatory storage facilities (primarily Lake Pleasant) by CAWCD. Therefore, while the CAP water to be used by the proposed Project would be the same as the CAP water currently being delivered to the proposed Site, it would not displace or be a substitute or exchange for agricultural water. CAP agricultural deliveries would continue to be available to the portions of the proposed Site retained in irrigated agriculture, under entitlements of that land through the Hohokam Irrigation District. That CAP agricultural water would be blended with the proposed Project water treatment system wastewater stream and used to continue to irrigate crops or pastures on the proposed Property.

Comment No. 09 **Issue Code: 07**

The proposed Project conducted hydrologic studies for concurrence of the Arizona Department of Water Resources that complete reliance on groundwater would have minimal impact on the very extensive local aquifer. This would hold true for a period of 40 years, well beyond the projected Project life. The local aquifer is currently experiencing dramatic recovery from historical overdrafting.

The size of the aquifer involved is large and the proposed Project has the economic ability to pump from depths that are not economically feasible for agricultural irrigators, the major competing pumpers

DEIS COMMENTS, WAPA, SUNDANCE ENERGY PROJECT, AZ, MAY 2001

Water Resources	Reorganize the Chapter as follows:
Facilities	Water Resources
Surface Water	Surface Water
Groundwater	Facilities
Pipelines	Pipelines
Surface Water	Transmission Lines
Groundwater	Groundwater
Transmission Lines	Facilities
Surface Water	Pipelines
Groundwater	Transmission Lines

36/25 (cont.)

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Comment No. 09 (cont.) **Issue Code: 07**

in the region. This means that the proposed Project could pump groundwater even when others in area couldn't. However, the ability to do so does not mean that the proposed Project necessarily would do so. The proposed Facility would be a merchant wholesale generator, not anticipated to generate during periods when demand is substantially reduced and/or serviceable by more cost-efficient combined cycle facilities. If a drought occurred in the region that was extensive enough to greatly affect the groundwater aquifer, the associated economic effects of the drought would likely include a reduced demand for power.

If there were no CAP water or groundwater available, the proposed Facility simply would not operate unless it could feasibly secure another supply of water. For example, the City of Coolidge sewage treatment facility effluent discharge is located a few miles north of the proposed Facility and might be suitable. Use of such effluent is not, however, currently being considered.

See responses to Comment No. 08 above, Francis Slavin Comment No. 11, and Public Hearing Comment Nos. 18 and 19.

Comment No. 10 **Issue Code: 20**

The two make-up, water storage ponds would be approximately three acres each. Historic evaporation rates in the Coolidge area are approximately 105 inches per year or 8.75 feet. Therefore, the evaporative loss for each 3-acre pond would be approximately 27 acre-ft/year. This small loss due to evaporation does not make a covered pond economically realistic for the proposed Project. Percolation losses would be minimized by constructing the pond with a clay liner. A polyethylene liner would be impractical because the ponds would have to be periodically purged of sediment which could damage the liner.

Comment No. 11 **Issue Code: 07**

A summary of the requirements for the Aquifer Protection Plan, including a description of BADCT, is provided as an attachment to this Comment Response Document.

Comment No. 12 **Issue Code: 07**

The wastewater and storage ponds would be designed with sufficient embankments to accommodate the expected maximum storage plus a 100-year precipitation event. Therefore, overflows are not expected. Additionally, the wastewater pond would be lined with at least a 60 mil polyethelene liner, thus minimizing the probability of leakage. The design of the wastewater pond would be in compliance with all the provisions of Arizona's Aquifer Protection Permit program. A Spill Prevention Control Plan (SPCC) would be developed for the proposed Project. The SPCC would include a listing of potential pollutants as well as their possible sources and rates and direction of flow. Routine inspections, record keeping, installation of emergency equipment, and training would be outlined. The SPCC would discuss the response procedures, roles of responsible personnel, provisions for coordination with local officials, and evacuation procedures. An outline of the SPCC is attached.

Comment No. 13 **Issue Code: 07**

As part of the design of the proposed Facility, drains would be installed near all of the equipment with any probability of oil or fuel leaks. All drains would flow to a water/oil separator in event of a spill. Concrete containment structures would be constructed at the perimeter of this equipment to handle any sheet flow overflows. Concrete foundations and embankments would be constructed around the ammonia and fuel tanks designed to handle any overflow of the maximum amount of ammonia or fuel stored onsite at any time.

Comment No. 14 **Issue Code: 07**

As part of the design of the proposed Facility, drains would be installed near all of the equipment with any probability of oil or fuel leaks. All drains would flow to a water/oil separator in event of a spill. Concrete containment structures would be constructed at the perimeter of this equipment to divert any sheet flow overflows. Concrete foundations and embankments would be designed and constructed around the ammonia and fuel tanks with adequate volume to handle any overflow of the maximum amount of ammonia or fuel stored on site at any time plus precipitation of from a 100-year, 24-hour rainfall event.

Comment No. 15 **Issue Code: 07**

As part of the design of the Facility, drains would be installed near all of the equipment with any probability of oil or fuel leaks. All drains would flow to a water/oil separator in event of a spill. Concrete containment structures would be constructed at the perimeter of this equipment to divert any sheet flow overflows. Concrete foundations and embankments would be designed and constructed around the ammonia and fuel tanks with adequate volume to handle any overflow of the maximum amount of ammonia or fuel stored on site at any time plus precipitation of from a 100-year, 24-hour rainfall event. A Spill Prevention Control Plan (SPCC) would be developed for the proposed Project. The SPCC would include a listing of potential pollutants as well as their possible sources and rates and direction of flow. Routine inspections, record keeping, installation of emergency equipment, and training would be outlined. The SPCC would discuss the response procedures, roles of responsible personnel, provisions for coordination with local officials, and evacuation procedures. An outline of the SPCC is attached.

Comment No. 16 **Issue Code: 07**

A wetland delineation was conducted on the northwest corner of the proposed Site on May 30, 2001. The results of the delineation were that the absence of dominant hydrophytic vegetation, hydrology indicators, and hydric soils indicators support the determination that there are no wetlands on the proposed Site. No Clean Water Act permitting requirements apply.

Comment No. 17 **Issue Code: 03**

The proposed Facility would emit more than 250 tons per year of NO_x, CO and PM_{10}. Therefore, the proposed Facility is subject to the regulatory requirements for a PSD New Source Review. The Pinal County Air Quality Control District (PCAQCD) has the PSD permitting authority in Pinal County, Arizona. A PSD review involves a Best Availalble Control Technology determination, a PSD Class II increment consumption analysis, and an air quality analysis to determine whether project emissions will cause any violation of National Ambient Air Quality Standards. A PSD permit application was submitted to the PCAQCD in October 2000. The draft air permit and the associated technical support document was issued in April 2001. A public hearing on the draft air permit is scheduled on May 29, 2001, in Coolidge, Arizona. Public comments will be addressed and the Final Air Permit will be issued subject to a 45-day EPA review process. Following EPA review and any further dispositioning of EPA comments, the final PSD Air Permit will be issued.

Comment No. 18 **Issue Code: 03**

See Section 4.2 in the DEIS, PSD Analysis, pages 4-13 to 4-15. The air quality analysis indicated that all ambient air concentrations of criteria pollutants except NO_x are predicted to be below PSD significant levels. By definition, if a source's contribution to local air quality is below significance levels, the source is not considered to have a significant impact on air quality. Therefore, only a PSD Class

Comment No. 18 (cont.) **Issue Code: 03**

II increment analysis (a cumulative analysis in NEPA terms) is required by the regulations for NO_x. The results of this cumulative analysis is described in the DEIS, pages 4-13 to 4-15. See the updated air quality sections (Section 4.2 of the FEIS) for a similar analysis based on updated Project information.

Comment No. 19 **Issue Code: 03**

See the amended air quality analysis in Section 4.2 in the FEIS. The revised Class I impact analysis, using reduced NO_x emissions as a result of SCR, indicates that the maximum visibility reduction at the Superstition Wilderness and the Saguaro West National Park are predicted to be less than 5%. Therefore, according to the procedures described in the Federal Land Managers' Air Quality Related Values Workbook (FLAG), the proposed Facility emissions would not have an adverse effect on visibility at these two Class I areas.

At the request of the National Park Service for both the Sundance Energy Project PSD/Title V permit application and the Sundance Energy Environmental Impact Statement process, an Air Quality Related Values (AQRV) analysis was performed for the Casa Grande National Monument in Coolidge, approximately four miles north of the proposed Facility. The analysis was performed using the same CALPUFF/CALMET procedures described for the mandatory PSD AQRV analysis for the Class I Superstition Wilderness and the Saguaro West National Park.

The results of the analysis, shown in Table 1, predicted maximum visibility reduction to be for the full year modeling analysis 7.7% for one 24-hour period in February. Although one 24-period in February exceeded 5%, the next highest 24-hour visibility reduction in February was 2.75%. Therefore, according to the procedures developed by the FLAG Phase I Report, December 2000, the proposed Facility would not have any adverse effect on visibility at the Casa Grande National Monument.

Comment No. 19 (cont.) **Issue Code: 03**

Table 1
Visibility Impacts at Casa Grande National Monument

Month	Maximum 24-Hour Visibility Reduction (%)
January	2.81
February	7.73 – next highest 2.75
March	3.98
April	3.88
May	4.05
June	2.43
July	1.66
August	2.02
September	3.11
October	1.73
November	2.66
December	3.69

In addition to a visibility analysis, acid deposition (wet and dry) of sulfur and nitrogen was also calculated at the Casa Grande National Monument using the procedures described in the aforementioned FLAG document. The results of the analysis are shown in Table 2.

Table 2
Deposition at Casa Grande National Monument

Month	Maximum 24-Hour Deposition (kilograms/hectare)	
	Nitrogen	Sulfur
January	0.00723	0.00059
February	0.00413	0.00040
March	0.00227	0.00029
April	0.00131	0.00025
May	0.00117	0.00014
June	0.00364	0.00024
July	0.00253	0.00028
August	0.00300	0.00041
September	0.00537	0.00042
October	0.00031	0.00005
November	0.00284	0.00022
December	0.00169	0.00013

Comment No. 20 **Issue Code: 10**
Western has been involved in ongoing consultation efforts with the Tribes in the proposed Project area. To date, this consultation has concentrated on collecting information on the potential impacts to Traditional Cultural Properties or sacred sites. Four cultural groups, represented by descendants currently living in at least nine federally-recognized tribes, are potentially affected by the proposed Project. Two of these groups (Tohono O'Odham and Hopi) consider the nearby Casa Grande Ruins National Monument to be an important Traditional Cultural Place (TCP) critical to the survival of their cultural traditions. The integrity of this TCP is not affected by the proposed Project. This information has been included in Section 4.8 in the FEIS.

Comment No. 21 **Issue Code: 10**
Western has been involved in ongoing consultation efforts with the Tribes in the proposed Project area. To date, this consultation has concentrated on collecting information on the potential impacts to Traditional Cultural Properties or sacred sites. See Response to Comment No. 20 above.

Comment No. 22 **Issue Code: 10**
Western has been involved in ongoing consultation efforts with the Tribes in the proposed Project area. To date this consultation has been concentrated on collecting information on the potential impacts to Traditional Cultural Properties or sacred sites. For the proposed Site and the proposed Facility and transmission lines, no impacts have been identified. Consultation with these Tribes on the results of the ongoing cultural survey of the pipeline would take place upon completion of the survey report.

Comment No. 23 **Issue Code: 06**
The natural gas pipelines described in the DEIS are south of all of the proposed routes for the transmission lines. No other pipelines are known to be in the proposed routes for the transmission lines.

Comment No. 23 (cont.) **Issue Code: 05**
Pipeline cathodic protection would be installed along the pipeline where soil conductivity testing indicates a potential for corrosion. In the vicinity of transmission lines, cathodic protection is required because of the induced current from the overhead transmission lines.

Generally, the increased cathodic protection is only required in areas where a pipeline parallels a transmission line. The cathodic protection consists of deep well groundbeds located on the pipeline easement. Supplemental cathodic protection consisting of remote groundbeds and/or magnesium or zinc anodes attached to the pipe would be required where the pipeline and transmission line run parallel, and the extra protection may be required where the easements intersect.

Comment No. 24 **Issue Code: 05**
As part of the design of the proposed Facility, drains would be installed near all of the equipment with any probability of oil or fuel leaks. All drains would flow to a water/oil separator in event of a spill. Concrete containment structures would be constructed at the perimeter of this equipment to handle any sheet flow overflows. Concrete foundations and embankments would be constructed around the ammonia and fuel tanks designed to handle any overflow of the maximum amount of ammonia or fuel stored onsite at any time.

Comment No. 25 **Issue Code: 05**
The proposed Facility would have the capacity to store up to 30,000 gallons of aqueous ammonia for injection into the SRC air pollution control system. The aqueous ammonia solution, less than 20% ammonia and more than 80% water, would be stored in two 15,000-gallon tanks on the proposed Site. Upon the ammonia arrival to the proposed Site, ammonia would be pumped into one of the two ammonia storage tanks (see Figure 2-1, Proposed Facility Configuration). A concrete containment area would be constructed around the tanks with sufficient volume to handle the discharge of one 15,000-gallon tank. After the ammonia hose is connected from

Comment No. 25 (cont.) **Issue Code: 05**

the truck to the tank, a second vapor recovery hose would be connected from the top of the tank back to the truck to contain any residual vapors that may be in the ammonia tank. In the unlikely event of spills during the delivery of ammonia or during operations, water hoses would be immediately available to dilute the spilled ammonia within the containment area. Operation of the SCR would not involve any high pressure release of ammonia vapor. The aqueous ammonia would be pumped from the storage tanks to the SCR reactor chamber in liquid form. The ammonia would then be heated sufficiently for vaporization, and injected into the SCR for mixture with the exhaust stream.

Comment No. 26 **Issue Code: 05**

See response to Comment No. 15. SPCC would be developed for the proposed Project. The SPCC would include a listing of potential pollutants as well as their possible sources and rates and direction of flow. Routine inspections, record keeping, installation of emergency equipment, and training would be outlined. The SPCC would discuss the response procedures, roles of responsible personnel, provisions for coordination with local officials, and evacuation procedures. An outline of the SPCC is attached.

Comment No. 27 **Issue Code: 05**

The projects and activities considered in the Cumulative Impact section, Section 4.13, Table 4-19, page 4-64 represented the only related actions that were known to be taking place in the vicinity of the proposed Project. Since the issuance of the DEIS, information has been received concerning the future development of some parcels of nearby agricultural land into residential housing subdivisions. This information is discussed in the Cumulative Impacts section, Section 4.13 of the FEIS.

Comment No. 28 **Issue Code: 24**

Information concerning other actions in the area has been included in the Cumulative Impact section. Foremost among these is the potential development of residential housing areas on several parcels of the land in the vicinity of the proposed Project. This development would change the context within which the impacts of the proposed Project would take place (e.g., noise). Increased development of the surrounding area would result in more receptors of the noise, but it would also increase the background noise level of the area resulting in a lower relative change in noise levels at startup of the turbines.

Comment No. 29 **Issue Code: 01**

The zoning of the adjacent land resources is discussed in Sections 3.1 and 4.1 of the DEIS. Since the issuance of the DEIS, information has been presented concerning the potential future rezoning of some parcels of land in the vicinity of the proposed Project. Several parcels of land are being considered for development as housing subdivisions. The foreseen impacts of these subdivisions include changes to land use and background noise. The foreseen impacts of the proposed Project to these future subdivisions include right-of-way conflicts, potential impact to housing prices, and visual impacts. These impacts are discussed in the revised Section 4.13 on cumulative impacts.

The proposed Site was rezoned from General Rural to Industrial through the Pinal County Board of Supervisors on December 21, 2000 (Case No. IUP-005-00). Under the procedures of the rezoning process, notification of the action was posted in the local newspapers and on the proposed Site, and all adjacent landowners were notified by letter. Only two landowners attended the hearings. Pinal County does not have a Land Use Master Plan, and all rezoning applications are considered on a case-by-case basis at the time of the application. Any consideration of related impacts to future zoning decisions are

Comment No. 29 (cont.) **Issue Code: 01**

included in this case-by-case decision process. As part of the Pinal County Industrial Use permit resulting from the rezoning action, the following stipulations were applied to the proposed Facility:

- The Industrial Use Permit is issued for an electrical peaking power generating facility, as shown and set forth in the application submittal documents and as may be modified at the public hearing(s)

- Sundance Energy shall adhere to all Federal, State, and County regulations and shall submit evidence that they have secured or will secure all required approvals and permits

- Sundance Energy shall provide a Traffic Impact Analysis satisfactory to the requirements of the Pinal County Public Works Department

- Sundance Energy shall grant and record a Resource Management Easement to all adjacent farm owners/operators

- Sundance Energy shall provide landscaping as required by Pinal County

- Sundance Energy shall install fire hydrants as required by the Uniform Fire Code, and shall contract for fire protection services prior to completion of the facility;

- Sundance Energy shall pave the existing right-of-way for Randolph Road to minimum County standards from the western boundary of the subject property to 11 Mile Corner Road

- Sundance Energy shall provide dust control mitigation measures satisfactory to the requirements of the Pinal County Air Quality Control District

Comment No. 29 (cont.) **Issue Code: 01**
The EIS discusses the environmental and socioeconomic impacts of the proposed Project and compares the relative impacts of the alternative routes for the transmission lines. The EIS does not discuss the economic factors beyond briefly mentioning the site selection process performed by the applicant. A comparison and contrast of economic factors or business considerations are beyond the scope of the Sundance Energy EIS and are not part of the NEPA process.

Comment No. 30 **Issue Code: 01**
The EIS discusses the environmental and socioeconomic impacts of proposed Project and compares the relative impacts of the alternative routes for the power lines. The EIS does not discuss the economic factors beyond briefly mentioning the site selection process performed by the applicant. A comparison and contrast of economic factors or business considerations are beyond the scope of the Sundance Energy EIS and are not part of the NEPA process.

Comment No. 31 **Issue Code: 01**
The zoning of the adjacent land resources is discussed in Sections 3.1 and 4.1 of the DEIS. Since the issuance of the DEIS, information has been presented concerning the potential future rezoning of some parcels of land in the vicinity of the proposed Project. Several parcels of land are being considered for development as housing subdivisions. The foreseen impacts of these subdivisions include changes to land use and background noise. The foreseen impacts of the proposed Project to these future subdivisions include right-of-way conflicts, potential impact to housing prices, and visual impacts. These impacts are discussed in the revised Section 4.13 on cumulative impacts.

Comment No. 32 **Issue Code: 21**
While cost and landowner approval are part of the overall routing process and therefore, part of the decision process, they are not part

Comment No. 32 (cont.) **Issue Code: 21**
of the assessment of environmental impacts. The costs and landowner approval information available to date has been taken into account in designing the routing alternatives and in the designation of Alternative 3 as the preferred route. The comparison of the environmental impacts of each alternative route was presented in the Summary of Impacts table.

Comment No. 33 **Issue Code: 17**
The DEIS states that Western's formal process for determining the availability of capacity for the proposed interconnection is in its preliminary stages. The evaluation of environmental impacts in this EIS is one of the preliminary steps. At this point, it is foreseen that there is enough potential capacity to continue the formal determination process. The proposed Project is a peaking power plant. Economics, construction schedules, and other factors would influence the number of turbines installed over time. However, the EIS assesses the impacts of all 12 turbines.

Comment No. 34 **Issue Code: 17**
The DEIS states that Western's formal process for determining the availability of capacity for the proposed interconnection is in its preliminary stages. The evaluation of environmental impacts in this EIS is one of the preliminary steps. At this point, it is foreseen that there is enough potential capacity to continue the formal determination process.

Comment No. 35 **Issue Code: 17**
TBA.

Comment No. 36 **Issue Code: 25**
The DEIS was organized in a manner thought to be conducive to public review of the proposed action and alternatives. A reorganization of the FEIS was considered which would reduce the

Comment No. 36 (cont.) **Issue Code: 25**

redundancy, however, the FEIS consists of a few amended sections and the CRD, so no reorganization was practical.

May 7, 2001

John Holt
Desert Southwest Regional Office
WAPA
P.O. Box 6457
Phoenix, AZ
85005-6457
FAX 602-352-2630

Re: Sundance Energy Project Transmission Line Siting
Support of "Alternative 3"

Dear Mr. Holt,

As a local property owner in Pinal County, I support "Alternative 3" as the correct alternative for placement of transmission lines to serve the Sundance Energy Project.

Sincerely,

David Wuertz

01/22

Comment No. 01 **Issue Code: 22**
The commentor's preference has been noted.

ATTACHMENTS

Exhibit C-1

ARIZONA DEPARTMENT OF WATER RESOURCES

HYDROLOGY DIVISION

MEMORANDUM

TO: Power Plant and Transmission Line Siting Committee

THROUGH: Greg Wallace, Chief Hydrologist
Arizona Department of Water Resources

Dennis Sundie, Siting Committee Member

FROM: Dale Mason, Supervisor
Groundwater Modeling Section
Hydrology Division

DATE: November 30, 2000

RE: Hydrologic Review of PPL Sundance Energy, Certificate of Environmental Compatibility Application, A.C.C. Docket No. L-00000W-00-0107

Hydrology has reviewed the supplemental hydrologic report, *Water Resources Technical Report, Sundance Energy Project*, filed by PPL Sundance Energy with the Department on November 27th. The report supports PPL Sundance Energy's application for a Certificate of Environmental Compatibility.

This memo consists of two sections; the first is an analysis of recent water level and pumpage records for the area around the proposed plant site. The second section is a review of the applicant's projected plant water use and a hydrologic analysis of potential water level impacts near the plant site.

Recent Trends

1. Water Levels

The proposed plant site is located on about 300 acres of agricultural lands in Sections 1 and 2 of Township 6 South, Range 7 East, located in the Pinal Active Management Area (AMA). The proposed plant site is in an active agricultural area that contains numerous irrigation wells. Some of these wells have water level records dating back to the early 1940's.

The U.S. Geological Survey measured water levels in the AMA to support geohydrologic

investigations that were undertaken by that agency prior to the creation of the Department. The Department conducted water level sweeps of the AMA in 1988 and 1998 as part of an ongoing water level data collection program. In addition to the periodic water level sweeps, the Department measures water levels annually in selected wells throughout the State. These wells, called index wells, can be used to identify long-term changes in the water table.

Current water levels in the area around the proposed plant site are between 80 and 100 feet below land surface. There are two registered wells located on land purchased for the proposed plant site. The wells are 55-622427 and 55-622428, and neither well has a recent water level measurement. Since the mid-1980's, water levels in the area around the proposed plant site have risen by as much as 120 feet. A water level index well located one mile south of the proposed plant site has a recorded water level recovery of 115 feet since 1985.

2. Recent Pumpage

Groundwater pumpage for agricultural development in the Pinal AMA began in the early 1930's. The results of groundwater pumpage for irrigation is that by the mid-1980's water level declines of as much as 350 feet occurred in some areas of the AMA. Recorded water level declines in the area of the proposed plant site from 1950 to 1975 were about 130 feet.

Since 1989, Central Arizona Project (CAP) water has been available for use in the Pinal AMA. The Hohokam Irrigation District (HID) provides CAP water to lands in the area around the proposed plant site. CAP water utilization has reduced groundwater pumpage in the area around the plant site. Reported annual groundwater pumpage for the two wells associated with the land purchased for the plant has ranged from zero to 500 acre-feet from 1984 to 1999. The combined effects of reduced groundwater pumpage, application of CAP in-lieu water, and application of CAP irrigation water has led to the water level recovery that is currently being observed in area around the plant site.

Water Level Impact Analysis

1. Projected Plant Water Use

The proposed plant is designed to provide peak-load electrical generation capacity and will use less water than a power plant that supplies base-load electricity. PPL Sundance estimates plant water use will average about 950 acre-feet of water per year based on 6,500 hours of operation per year. PPL Sundance is currently negotiating with the Central Arizona Water Conservation District (CAWCD) and HID for a supply CAP water for plant cooling. CAP water will be transferred through the existing HID canal system to the plant site. Groundwater will be used only as a backup source of water during interruption of CAP water supplies. Groundwater for backup cooling will be supplied by the two existing irrigation wells on the property.

2. Well Impact Analysis

PPL Sundance calculated potential impacts of plant pumpage on the local water table using a simple Theis drawdown analysis. Two groundwater pumpage scenarios were developed that used estimated maximum and minimum groundwater pumpage values of 190 acre-feet and 50 acre-feet per year, respectively. The Theis solution used reasonable hydrologic assumptions about local aquifer parameters and calculated drawdowns in the aquifer after 40 years of pumping.

The results of the two scenarios showed very little impact to water levels in the aquifer at the pumpage levels estimated by PPL Sundance. The maximum drawdown calculated was less than 5 feet after 40 years of plant pumpage.

Conclusions:

The impact on local water levels by PPL Sundance power plant will be controlled by the amount of groundwater pumped for plant cooling. Using the best case scenario of full utilization of CAP water for the 40-year life of the plant, there would be virtually no impact to local water levels. The current water level recovery will continue until the aquifer comes into equilibrium with the local pumpage regime. Under a worst case scenario of withdrawing 190 acre-feet per year the impact of the plant's pumpage probably will be minimal, the current water level recovery rate may slow and the total long-term recovery of local water levels will decrease only slightly.

ARIZONA DEPARTMENT OF WATER RESOURCES
HYDROLOGY DIVISION

MEMORANDUM

TO: Power Plant and Transmission Line Siting Committee

FROM: Greg Wallace, Chief Hydrologist
Arizona Department of Water Resources

DATE: March 15, 2001

RE: Supplement to the 11/30/00 Hydrologic Review of PPL Sundance Energy, Certificate of Environmental Compatibility Application, A.C.C. Docket No. L-00000W-00-0107

At the request of Jay Moyes, Attorney for Sundance Energy and Stephen Olea, the Arizona Corporation Commission Member of the Siting Committee, I have personally reviewed an additional worst case scenario which projects the potential for 950 acre feet of groundwater pumpage per year for 40 years which results in a worst case drawdown of 15.6 feet at the well. And an approximate 1-foot drawdown at ¼ mile distance from the well. The impact of such withdrawals would still be considered by ADWR to have minimal impact on the area and consistent with local management plans.

AQUIFER PROTECTION AND RECLAIMED WATER INDIVIDUAL PERMIT APPLICATIONS TECHNICAL REQUIREMENTS

AQUIFER PROTECTION INDIVIDUAL PERMIT

I. Topographic Map

- Facility location
- Use of adjacent properties
- Known water wells within ½mile

II. Facility Site Plan

- Property lines
- Structures
- Water wells
- Injection wells
- Drywells and their uses
- Topography
- Point(s) of compliance (POC)

III. Facility Design Documents

- Proposed or as-built design details and proposed or as-built configuration of basins, ponds, waste storage areas, drainage diversion features, or other engineered elements

IV. Proposed Facility Discharge Activities

- Chemical, physical, and biological characteristics of the discharge
- Rate, volume, and frequency of the discharge
- Location of the discharge

V. Description Of The BADCT To Be Employed

- Alternative discharge measures considered
- Evaluation of each alternative discharge control
- Technical and economic advantages and disadvantages of each alternative
- Justification for selection or rejection of each alternative

VI. Proposed POCs

- Demonstration that the facility will not cause or contribute to a violation of an Aquifer Water Quality Standard (AWQS) at the applicable POC
- No additional degradation of the aquifer

VII. Hydrogeologic Study

A. Technical Requirements of Hydrogeologic Study

- Description of the surface and subsurface geology
- Location of surface water bodies, perennial, intermittent, or ephemeral
- Characteristics of the aquifer including depth, hydraulic conductivity, and transmissivity
- Rate, volume, and direction of surface and groundwater flow
- Location of the 100-year flood plain
- Existing water quality of the aquifer
- Known soil contamination
- Potential of the discharge to cause leaching of pollutants from surface soils
- Anticipated changes in the water quality expected because of the discharge
- Map of the facility's discharge impact area
- Criteria and methodologies used to determine the discharge impact area; or
- POC location(s)

VIII. Contingency Plan (Must address these 5 situations)

- Violation of permit condition
- Violation of AWQS
- Alert Level is exceeded
- Discharge Limitation is exceeded
- Endangerment to public health and environment

A. Contingency Response (Examples)

- Verification sampling
- Notification to water users
- Additional monitoring
- Inspection, testing, maintenance
- Additional hydrogeologic study
- Corrective action

IX. Corrective Action

- Source control
- Soil clean-up
- Clean-up of surface waters
- Aquifer clean-up
- Mitigation of impact on aquifer use

X. Proposal for Monitoring, Compliance, and Closure/Post Closure Activities

- Alert levels
- Discharge limitations
- Monitoring requirements
- Compliance schedules
- Temporary cessation, closure, and post-closure strategies or plans

RECLAIMED WATER INDIVIDUAL PERMIT

I. Source Of Reclaimed Water To Be Applied For Direct Reuse

- Standard Industrial Code (SIC) classification
- Chemical, physical and biological characteristics
- Flow rate

II. Volume Generated for Direct Reuse

- Volume generated on an annual basis

III. Description of the Direct Reuse Activity

- Identify reuse activity
- Types of crops to which reclaimed water will be applied

IV. Class of Reclaimed Water to be Applied for Direct Reuse

- Determine minimum class of water quality required to support reuse activity

SPILL PREVENTION CONTROL PLAN SUMMARY

IDENTIFICATION OF POLLUTANTS OF CONCERN

- Prediction of direction of flow, rate of flow, and quantity of oil that could be discharged (SPCC)
- Description of potential pollutant sources, risk identification, and material inventory (SWPPP)

COORDINATOR

- Designated person who is accountable for oil spill prevention and who reports to line management (SPCC)
- Pollution prevention planner or team under supervision of plant manager (SWPPP)

OPERATIONAL CONTROLS

- Appropriate spill prevention and containment procedures (SPCC)
- Preventative maintenance program, good housekeeping, spill prevention and response procedures, best management practices (BMPs) (SWPPP)

STRUCTURAL CONTROLS

- Appropriate containment and/or diversionary structures or equipment, security (SPCC)
- Sediment and erosion controls, site-specific stormwater BMPs, activity-specific BMPs, enclosure of salt storage piles (SWPPP)

INSPECTIONS

- Testing and inspection of pollution prevention/control equipment on scheduled basis and in accordance with written procedures (SPCC)
- Routine visual inspection of designated equipment and plant areas, written procedures for follow up, and annual site inspection to verify the accuracy of pollutant source description, drainage map, and controls (SWPPP)

EMPLOYEE TRAINING

- Owners/operators responsible for training personnel on applicable regulations and in the operation and maintenance of equipment, and should schedule and conduct spill prevention briefings for personnel (SPCC)
- Training for employees at all levels in spill response, good housekeeping, and materials management according to periodic training dates (SWPPP)

COORDINATE WITH LOCAL AUTHORITIES

- Follow contingency plan provisions of 40CFR109 including consultation with State and local governments (SPCC)

EMERGENCY/SPILL RESPONSE EQUIPMENT

- Appropriate container and/or diversionary structures or equipment, or, a written commitment of equipment and materials required to expeditiously control and remove any harmful quantities (SPCC)
- Necessary equipment to implement a spill cleanup (SWPPP)

NOTIFICATION/RECORD KEEPING

- Written procedures and records of inspections maintained for 3 years, and detailed notification requirements if spill event > 1000 gallons (SPCC)
- Record spills and other discharges, record stormwater quality and quantity, document inspection and maintenance activities (SWPPP)

EVACUATION PROCEDURES

PLAN LOCATION/DISTRIBUTION

- Maintain at facility if attended at least 8 hours per day, or at nearest field office (SPCC)
- Maintain at facility (SWPPP)

MODIFICATION OF PLAN

- By the owner/operator if changes to facility, or if warranted by findings of 3 year evaluation (SPCC)
- If plan fails to control pollutants in stormwater, or if there is a change in design, construction, operation, and maintenance, or if requested by director (SWPPP)

CERTIFICATION

- Plan must be reviewed and certified by a professional engineer (SPCC)
- Signed and certified in accordance with 40 CFR 122.22 (SWPPP)

References

Memphis State University. 1971. Effects of noise on wildlife and other animals. NTID300.5, U.S. Environmental Protection Agency, Washington, D.C. 74p.

study program, which will be administered by a group of federal agencies, will concentrate research efforts and accelerate results. SRP will continue to support this effort.

Salt River Project has also contributed to medical research conducted by the Department of Energy. SRP will continue its contributions to the medical research of EMF and biological effects.

SRP's COMMITMENT TO COMMUNICATING ABOUT EMF

Because electric and magnetic fields exist all around us, exposures cannot be controlled simply by managing fields given off from power facilities. Studies show that primary sources of EMF exposure for most people are inside the home and workplace. This is largely the case because we are closer to those kinds of sources than we are to power facilities. For most customers in SRP's service territory, the greatest opportunity for managing exposures to EMF belongs to the customers themselves. For those customers, measures such as sitting several feet away from a television set, moving an electric alarm clock an arm's length away, and moving away from a microwave oven while it's operating, can provide greater overall exposure reduction.

SRP has gathered much information about EMF. Information about the status of medical research, field management techniques, and exposure reduction opportunities is available for all of SRP's customers and employees.

The Salt River Project is committed to openly sharing EMF knowledge so that customers and employees can make informed decisions about prudent field management. SRP's information exchange program includes:

1. Training of SRP staff and representatives to respond to customer questions concerning EMF. Customer information exchange takes place by correspondence, telephone, and in-person visits.
2. Employee information exchange, through informational mailings, newsletter articles, and in-house presentations.
3. The EMF Speakers Bureau - a group of SRP employees trained with a thorough knowledge of EMF issues and medical research status. These volunteer employees are available for community presentations upon request.
4. EMF measurements are made upon request, at no charge to SRP customers and community members living near SRP power facilities. Qualified* individual residential, commercial, and industrial customers are eligible for this service.

** The current property owner must request the measurement. For other requirements of qualification, contact the Customer Information Center at 236-8888.*

The Salt River Project is committed to communicating to customers and employees about EMF, and will continue to make our knowledge available. We encourage our customers and employees to learn all they can about EMF, and make prudent decisions about exposures and field management.

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SRP

ELECTRIC & MAGNETIC FIELDS

SALT RIVER PROJECT'S POSITION

April 1992

The Salt River Project recognizes and shares the concerns of its customers and employees about the possible association between Electric and Magnetic Fields (EMF) and health effects. The present state of EMF medical research remains clouded with inconsistent results. Is there conclusive evidence that EMF exposures can be associated with health effects? What EMF exposure level is safe or harmful? Which attribute of electric or magnetic fields, or both is of concern?

NO EASY ANSWER

The answers to these questions are not yet clear. The statistical public health studies, or epidemiological studies, that have been conducted so far have yielded mixed results. As many studies have shown no association between EMF and health effects as those that have shown positive associations. An equally large group of studies have shown no conclusive results at all. The biological studies of EMF have attempted to determine whether a cause and effect relationship exists between exposures and health effects. These studies have also yielded inconclusive and inconsistent results.

WHAT WE'RE DOING

Although medical research results have not been conclusive, the possibility of an association between EMF and health effects remains an important question that must be answered. Salt River Project has supported and funded EMF medical research and will continue to pursue answers to EMF questions. SRP is actively conducting research and investigating prudent methods of modifying the design and location of our transmission, distribution and substation facilities. Additionally, Salt River Project is committed to sharing and communicating information about EMF with our customers and employees so that they are able to make prudent decisions about managing their own exposures.

PRUDENT FIELD MANAGEMENT

There is no place where electric and magnetic fields do not exist. Electromagnetic waves that are used for communication signals produce fields throughout the earth's atmosphere, indoors and outdoors. The earth's molten core produces a very strong magnetic field that exists all over the globe. And every electrical device in our modern lives, such as appliances, computers, and power facilities, produces electric and magnetic fields.

Because medical research has not been able to determine whether EMF is safe or hazardous or which attribute(s) of a field might be related to biological effects, no one knows whether it is beneficial to limit human exposures to strong fields or weak fields. Magnetic field strength (measured in units of milliGauss, or mG) is one of many measurable attributes of EMF and has been the focus of most of the epidemiological research. Fields can also be measured by wave shape, duration, frequency,and many other parameters. But no consistent correlation appears between particular measures of milliGauss and biological effects, and researchers acknowledge that field strength may not be the proper measure of EMF exposure.

In the absence of knowledge that reducing or increasing field strengths will produce a health benefit, the Salt River Project believes that "field management" is a prudent approach. Prudent Field Management suggests that as long as the possibility exists that some aspect of a field may be related to health effects, prudent steps should be taken to manage the field regions around sources of electric and magnetic fields wherever possible.

SRP is committed to exploring ways of managing fields from electric power facilities by:

1. Incorporating "EMF Sensitivity" into the processes of siting new power lines and substation facilities, and the property management of existing Rights of Way and easements. SRP will examine options for siting facilities in areas least affected by EMF exposures, avoiding schools, daycare centers, hospitals, and other public facilities wherever practical. While multiple options for siting do not always exist, preference will be given to siting away from these types of facilities wherever the option is feasible.
2. Engineering options to manage fields in areas where people may be exposed. Studies are underway to determine the practical merits of taller transmission and distribution structures, arrangements of conductors, and management of power flows within the electric system to reduce the field regions around power facilities. SRP is committed to continuing this type of research and will implement options that are technically and economically sound, and prudent.

SUPPORT OF MEDICAL RESEARCH

The electric utility industry is responsible for the vast majority of medical research of EMF and health effects undertaken so far. Much of the epidemiological and biological research has been sponsored by the Electric Power Research Institute (EPRI). Through contributions to EPRI, Salt River Project has helped to support EPRI's EMF Research Program. EPRI's budget for EMF research last year was approximately eight million dollars and is expected to increase this year. Many of the most noted contributions to epidemiological research have come from EPRI programs. Examples include the University of Southern California study conducted by Dr. John Peters, and the study conducted by Dr. David Savitz of the University of North Carolina.

Through participation in the Large Public Power Council, SRP has also helped to develop a national EMF research strategy. The national program would be supported by both private and federal funds and would focus on both medical research and public information dissemination. The national