DRY LAKE WIND PROJECT

ENVIRONMENTAL ASSESSMENT

October 2008

Photosimulation of Dry Lake Wind Project Site from State Highway 377

EA# AZ-410-2008-0019

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Bureau of Land Management
Safford Field Office
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UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ARIZONA
SAFFORD FIELD OFFICE

EA #:	AZ-410-2008-0019
Project Name:	Dry Lake Wind Project
Lease/Serial/Case File No.	AZA 33259
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List of Acronyms and Abbreviations

Acronym	Meaning
AADT	Annual Average Daily Traffic
ACEC	Areas of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
ANSI	American National Standards Institute
APS	Arizona Public Service
ASLD	Arizona State Land Department
ASTM	American Society for Testing and Materials
AZGS	Arizona Geological Survey
AZPDES	Arizona Pollutant Discharge Elimination System
BLM	Bureau of Land Management
BMP	Best Management Practice
EA	Environmental Assessment
EIA	Energy Information Administration
EMF	Electric and magnetic field
EMI	Electromagnetic interference
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FCR	Field Council Representative
FONSI	Finding of No Significant Impact
GE	General Electric
HAZMAT	Hazardous Materials
IBR	IBERDROLA RENEWABLES, Inc.
kV	kilovolt
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NESC	National Environmental Services Center
NHPA	National Historic Preservation Act
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
O&M	Operations and Maintenance

Acronym	Meaning
RMP/FEIS	Resource Management Plan and Final Environmental Impact Statement
ROD	Record of Decision
ROW	Right-of-way
SCADA	Supervisory, control and data acquisition
SHPO	State Historic Preservation Office
SODAR	Sonic detection and ranging system
SPCC Plan	Spill Prevention, Containment, and Countermeasure Plan
SWPPP	Stormwater Pollution Prevention Plan
TSP	Total suspended particulate
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	Volatile Organic Compound
WEST	Western Ecosystems Technology, Inc

EXECUTIVE SUMMARY

Proposed Action

IBERDROLA RENEWABLES, Inc. (IBR – formerly PPM Energy, Inc.) is proposing to construct, operate, and maintain a wind generation facility in Navajo County, Arizona. IBR's project, referred to as the Dry Lake Wind Project (Project), is located about 6 to 18 miles north-northwest of the City of Snowflake, just east of Arizona State Highway 377 and southwest of the I-40 corridor (see Figure 1-1). The Project would provide up to 378 megawatts (MW) of wind energy and consist of multiple phases:

- Phase I would include 64 MW of wind energy with up to 30 wind turbines (project maps display 30 primary and 8 alternate turbine locations), access roads, an interconnection substation, an Operations & Maintenance (O&M) facility, and collector lines to transmit the generated energy to the substation. The turbines would range in size from 1.5 to 3.0 MW each.
- Subsequent phases would include comparable facilities able to provide a total of up to 314 MW of additional wind-generated energy. Because turbines would also range in size between 1.5 and 3.0 MW, the total number of project turbines for subsequent phases would be between 105 and 209.

The turbines, access roads, collector lines, substation and O&M facilities would be constructed on private leased land, Arizona state lands, and lands managed by the U.S. Department of the Interior, Bureau of Land Management (BLM).

IBR has proposed this Project to help meet growing demands for electricity in Arizona. Recent national and regional electrical demand forecasts predict that the growing consumption of electrical energy will continue to increase into the foreseeable future and will require development of new energy sources to satisfy the demand. The need for renewable sources of energy is recognized at both the national and state levels. Arizona has acknowledged the public benefits of renewable energy generation by putting in place a statewide Renewable Portfolio Standard. This project would help Arizona to meet its stated renewable energy goal of 15 percent by 2025.

BLM is responsible for processing applications for grants of Right-of-Way (ROW) for use of federal lands administered by the BLM. This requires completing environmental reviews pursuant to the National Environmental Policy Act of 1969 (NEPA) [42 United States Code (USC) 4332]. The purpose of this Environmental Assessment (EA) is for the BLM to evaluate and consider whether granting a ROW to IBR for developing the Dry Lake Wind Project on public lands – the Proposed Action – can be completed in an environmentally sound manner and is consistent with the policies of the BLM's Wind Energy Development Program. Consistent with NEPA, the BLM prepared this EA to provide sufficient evidence and analysis for: 1)

determining whether to prepare a more detailed environmental impact statement; or 2) making a finding of no significant impact.

This EA describes the specific Project impacts, mitigation and benefits of the Project. This EA tiers off the BLM's *Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States* (Wind Energy PEIS) and the associated Record of Decision (ROD) that was signed on December 15, 2005. While the EA incorporates appropriate procedures, plans, and impact mitigation techniques required in the BLM's Wind Energy Development Program, it is a stand-alone and specific document for the Project.

Proposed Facilities

As currently proposed, the Project would consist of the following facilities (see Figure 2-1 and Figure 2-2):

- Wind turbines, generators, and associated generator step-up transformers. Phase I would consist of facilities able to generate up to 64 MW that are located throughout a 25 square mile area; subsequent phases would consist of facilities able to generate another 314 MW located in an expanded Project area that would total about 75 square miles (25 square miles on the west side, 50 square miles on the east side). Because turbines would range in size between 1.5 and 3.0 MW, the total number of project turbines would be from 126 to 239 (21 to 30 turbines for Phase I; 105 to 209 turbines for subsequent phases).
- Newly constructed access roads and existing roads temporarily widened and improved.
- A 34.5 kilovolt (kV) collector cable system linking each turbine to the next and to the Project substation(s). The collector cable system would be primarily underground, but would be overhead for connection of the turbines strings to the substation and where necessary to avoid further ground disturbance. Underground sections would be buried at least three feet below grade. Overhead sections would be installed on wooden pole or metal structures.
- One 69/34.5 kV project substation and associated overhead 69 kV switching station to connect to the Arizona Public Service (APS) transmission system would be constructed as part of Phase I of the project. Up to two more collector substations would be constructed to connect to the APS transmission system as part of the subsequent phases of the Project.

Phase I would connect to the existing APS Cholla-Zeniff-Show Low line bordering the Project area on the west side. Subsequent phases of the Project are planned on the east side of the Project area, connecting to the existing APS Cholla-Snowflake-Show Low 69 kV line, the proposed 69/500 kV APS Second Knolls Substation, or both.

As part of the Phase I interconnect agreement that was negotiated in the spring of 2008, IBR will have an additional 64 MW of rights on the APS Cholla-Zeniff-Show Low transmission line. The first of the subsequent phases (Phase II) therefore would consist of anywhere between 64 MW and the full build-out of 314 MW, dependent upon the amount available capacity on the 69/500-kV APS Second Knolls substation, as well as customer demand. Phase II would be constructed no earlier than 2010. If Phase II does not consist of the full build-out, additional subsequent phases would be built in 2011 or later.

Alternatives to the Proposed Action

The No Action Alternative is required to be analyzed under NEPA regulations. For this analysis, the No Action Alternative consists of no wind farm facilities being constructed on private, state or BLM lands. The effects to the environment that would result due to construction of the Project (described in Chapter 3) would not occur as part of the No Action Alternative, and existing land uses in the Project area would remain unchanged. Under this alternative, it is likely that IBR would attempt to develop wind projects elsewhere, either in Arizona or in other states.

Affected Environment and Environmental Consequences

Geology and Geohazards

Impacts on geological resources and geohazards from the Proposed Action are not expected to be significant, given the following: 1) prudent design that incorporates results of geotechnical studies; and 2) implementation of best management practices (BMPs), including appropriate strategies for selection of final locations of features, utilization of foundation types best suited to the site subsurface conditions, inclusion of drainage control features, and proper construction techniques.

Paleontology

Neither of the rock units exposed in the area (the Coconino Sandstone and Moenkopi Formation) is known to contain significant paleontological resources within the Project area. Nevertheless, IBR would educate all construction workers in the identification of fossiliferous deposits and the consequences of unauthorized collection of fossils on public lands. In the event that significant paleontological resources are uncovered during surface disturbing activities, construction workers would halt construction and IBR would confer with the BLM regarding the need to avoid adversely impacting the fossils, removing the fossils, and/or monitoring ongoing construction activities.

Soils

Construction of the wind turbines, access roads, electrical collection lines, and other Proposed Action facilities would increase the potential for soil erosion during construction. However, BMPs would be used during construction and operation of the Proposed Action to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated

material, protecting exposed soil, and stabilizing restored material. Therefore, the Proposed Action is not expected to result in significant impacts on soils.

Hazardous Materials/Wastes

There are no known hazardous waste sites located in or near the Project area. The construction, operation, and decommissioning activities associated with the Proposed Action will require the use of some hazardous materials, although the amount would be minimal. Types of hazardous materials include fuels (e.g., gasoline, diesel fuel), lubricants, cleaning solvents, paints, and explosives. If appropriate management practices are implemented, the impacts associated with hazardous materials and wastes are expected to be negligible to nonexistent.

Water Quality and Quantity

The Proposed Action would not have a noticeable impact on either municipal or private water uses in the Project area, and would not affect groundwater quality. Direct impacts on surface waters could occur from access road or collector lines crossing ephemeral streams and washes. Construction of the facilities associated with the Proposed Action could result in indirect impacts on surface water quality from increased runoff or sedimentation from disturbed areas or the increase in impermeable surfaces. Wind turbines would be built on uplands, avoiding surface water resources, which are located in lower positions in the landscape. Substations, access roads, and electrical collection lines would also be designed to minimize impacts on the water body. Use of BMPs would further avoid adverse impacts on these resources.

Wetlands/Riparian Zones

Riparian zones in the Project area are referred to as xeroriparian zones – while typically dry, these zones might temporarily maintain moderately moist soil and habitat conditions seasonally. Direct impacts on these xeroriparian zones could occur from access road or collector lines crossing the zones, resulting in vegetation clearing. Construction of the facilities associated with the Proposed Action could result in indirect impacts on riparian zones from increased runoff or sedimentation from disturbed areas or the increase in impermeable surfaces. Wind turbines would be built on uplands, avoiding xeroriparian zones, which are located in lower positions in the landscape. Substations, access roads, and electrical collection lines would also be designed to minimize impacts on the riparian zones. Use of BMPs would further avoid adverse impacts on these resources.

Floodplains

Turbines would be placed to avoid any mapped floodplains. Access roads would also be designed to avoid floodplains whenever feasible. There are no mapped floodplains that would be impacted during Phase I of the Project. Although efforts would be made to minimize potential impacts, it is possible that mapped floodplains could be crossed by access roads or collector cables associated with subsequent phases of the Project. However, with proper road and culvert design and the fact that the small increases in impermeable surfaces would be spaced out over a very large area, construction of the facilities associated with the Proposed Action is not expected to alter existing floodplain elevations.

Vegetation

Overall, the Project area is comprised of desert scrub and grassland with a high percent of bare ground. Construction of the wind turbines, access roads, electrical collection lines, and other associated facilities would result in direct and indirect impacts on vegetation. Approximately 969 to 1,627 acres of vegetation could be temporarily impacted by the Proposed Action, and about 146 to 250 acres could be permanently impacted. The temporarily disturbed areas would be reseeded; the Habitat Restoration Plan prepared for this Project would guide the restoration of native vegetation to the disturbed areas (see Appendix D). The Project is not expected to contribute to a significant change of the vegetative landscape in the Project area.

Invasive and Nonnative Species

IBR developed a Noxious Weeds and Invasive Species Control Plan (Weed Control Plan) for the Project that addresses monitoring and educating personnel on weed identification, and methods for treating infestations (see Appendix D). Use of certified weed-free mulching would be required. If trucks and construction equipment were to arrive from locations with known invasive vegetation problems, a controlled inspection and cleaning area would be established to visually inspect construction equipment arriving at the Project area and to remove and collect seeds that may adhere to tires and other equipment surfaces. The Proposed Action would not significantly impact the presence of invasive or nonnative species in the Project area.

Wildlife

The Project is anticipated to have some impacts on wildlife resulting from species displacement (temporary), habitat loss, habitat fragmentation, and direct wildlife mortality. The impacts would likely be associated with birds and bats being killed or injured by colliding with the operating wind turbine blades. Using data collected from wind energy sites around the country, avian mortality at the Project area would likely be similar to the national average of 3.1 birds/MW/year (NWCC 2004). This would equate to a mortality rate of about 1,172 birds per year or 3.2 birds per day after the entire 378 MW have been installed. Similarly, bat mortality studies for wind projects with similar levels of bat activity in the Rocky Mountain region suggest that mortality rates for the Project would be about 1.9 bats per MW per year. This would equate to a mortality rate of about 718 bats per year or 2.0 bats per day after the entire 378 MW have been installed. Bird and bat mortalities associated with the Project are not expected to significantly impact wildlife populations associated with the desert scrub/grassland and pinyon/juniper woodland habitats found within the Colorado Plateau Ecoregion.

Pronghorn antelope are the main game species of concern in the Project area. The impacts from construction activities (e.g., vehicular disturbance and increased noise levels) would temporarily impact pronghorn, most likely causing local animals to avoid the immediate project area while activities are ongoing. If high-impact construction activities (activities that involve blasting, grading, other major ground disturbance, and high levels of construction traffic) are scheduled to occur within 0.6 mile of functional watering facilities during the peak pronghorn fawning season (May 1 through June 30), BLM and Arizona Game and Fish Department biologists would be

consulted regarding the potential for the Project to impact pronghorn and the need to develop appropriate mitigation. There would be no long, linear fences installed as part of the Project that could interfere with pronghorn movements. The long term effect of increased vehicle traffic during operation of the Project has the potential to negatively impact pronghorn for the foreseeable future. However, the Project would not increase public access to the Project area. With implementation of appropriate measures to avoid and minimize wildlife impacts, the Project is not expected to significantly impact the local pronghorn population or populations of any wildlife species.

Threatened and Endangered Species

Special status species that have the potential to occur in the Project area were identified through correspondence with federal and state agencies. Species that are listed by the U.S. Fish and Wildlife Service, BLM, or state of Arizona as species of concern were all evaluated for the likelihood of occurring in the habitat within the Project area. Field surveys of the Project area further refined the analysis of the potential for rare species' occurrence. Species identified as occurring or having the potential to occur in the Project area include: Little Colorado spinedace, Gunnison's prairie dog, roundleaf errazurizia, Peeble Navajo cactus, and paper-spine cactus. Of these species, only the paper-spine cactus is known to occur in substantial numbers in the Project area. IBR would avoid any significant impacts on special status species through appropriate facility design and implementation of mitigation requirements (e.g., erosion control measures, transplanting).

Land Use

A majority of the land in the Project area is currently used for grazing, with some areas set aside for operations of a pig farm. The Project would be compatible with continued use of the area for grazing and operations of the pig farm. Further, IBR received a special use permit from the Navajo County Planning and Zoning Commission to construct and operate a wind energy project in the general Project area on December 15, 2005. As such, the Project would be consistent with the Navajo County Zoning Ordinance and the Navajo County Comprehensive Plan. The Project would not significantly impact existing land uses in the area and the Proposed Action would generally retain the existing rural sense and remote character of the landscape.

Visual Resources

A detailed visual resource assessment of the Project (see Appendix B) suggests that, although up to 492 feet tall, the wind turbines would not generally be visible from population centers in the nearby communities of Snowflake or Holbrook. Views of the turbines would be most evident to the public from points along State Highways 377 and 77. Turbines would be painted with a non-reflective white paint that would not substantially contrast with the skyline background. In addition to being visible during the day, Federal Aviation Administration (FAA) requirements for lighting turbines would result in approximately one third to one half of the structures being lit with white or red flashing lights that would be visible from the state highways at night. The BLM has designated the Project area as a visual resource management Class IV area, a designation that

allows management activities which require major modification of the existing character of the landscape. Given this designation and the results of the visual resource assessment, visual resources would not be significantly impacted by the Project.

Cultural Resources

A literature review and archeological field study was completed in the Project area. Based on the results of the survey, the configuration of the Phase I layout was adapted to avoid all the archaeological sites determined eligible for listing on the National Register of Historic Places (NRHP). Further, IBR has conducted additional archeological surveys of all areas affected by the Project and avoid disturbances to all sites eligible for listing on the NRHP. Also, Project construction would immediately halt in the event that there is an unanticipated discovery of cultural resources until the BLM and Arizona State Museum can be contacted. Because the Project would not result in an adverse effect to eligible cultural resources, the BLM recommended that a finding of "no historic properties affected" is appropriate for this undertaking. The State Historic Preservation Office (SHPO) concurred with this finding of project effect (SHPO letter dated October 23, 2007). Consequently, the Proposed Action is not expected to result in significant impacts on cultural resources.

Air Quality

Operation of a wind energy development project would not adversely impact air quality. Vehicle travel and maintenance activities might generate minor tailpipe emissions and fugitive dust, but these activities would be limited in extent and should have no appreciable air quality impacts (i.e., measurable, but not triggering significance criteria) during any phase of wind farm operations or decommissioning. Appropriate measures would be taken to reduce fugitive dust during construction of the Project.

Noise

Noise levels associated with construction of a wind farm would vary greatly depending on the type of equipment, operation schedule, and condition of the area being worked; construction noise would be temporary and is not expected to result in significant impacts. When in motion, the wind turbines emit a perceptible sound, the magnitude of which depends on wind speed and distance to listener. It is anticipated that the distance to avoid exceeding the U.S. Environmental Protection Agency (EPA) guideline at occupied residences would range from 400 to 500 feet. Turbines would not be placed within 500 feet of occupied residences; therefore, no significant noise impacts are expected to occur.

Socioeconomics/Environmental Justice

Overall, construction and operation of the Proposed Action would result in positive socio-economic impacts, due to the minor increase in regional employment, and the revenues generated from state and federal income taxes, state sales tax, property taxes paid by IBR, and both federal and state corporate income taxes paid on taxable revenues.

A study of wind farms in the United States examined data on property sales in the vicinity of wind projects and determined whether and the extent to which the presence of a wind project had an influence on property values for properties that were sold. The results of the study indicated that there is no empirical support for the claim that wind development harms property values. In fact, the study indicated that for the great majority of wind projects, the property values actually rose more quickly in the viewshed than they did in the comparable community. Moreover, values increased faster in the viewshed after the projects came on-line than they did before. Finally, after projects came online, values increased faster in the viewshed than they did in the comparable community. Give the results of this study, the Proposed Action would not be expected to adversely affect property values.

Based on the absence of environmental justice populations, the development of a wind power generating facility would not result in a disproportionate impact on any low income or minority populations. Therefore, there are no environmental justice concerns for the Proposed Action.

Public Services

The Proposed Action is expected to have a minimal effect on the existing infrastructure. The mitigation measures undertaken to avoid impacts on water supply and communication providers would avoid negative impacts on public services. The Proposed Action would not result in a long-term increase in traffic to the Project area, and therefore would not impact traffic patterns in the region. IBR developed a transportation plan that was included in its Plan of Development and submitted to the BLM.

Human Health and Safety

There are no residences or public gathering places located within the Project area. As such, there are few existing risks to human health and safety in the Project area. Nevertheless, to avoid and minimize potential impacts on human health and safety, IBR developed a health and safety plan to protect both workers and the public during construction, operation, and decommissioning of the Project. It was included in the Plan of Development and submitted to the BLM.

CHAPTER 1 PURPOSE, NEED, AND BENEFITS

1.1 Introduction

IBERDROLA RENEWABLES, Inc. (IBR - formerly PPM Energy, Inc.) is proposing to construct, operate, and maintain a wind energy generation facility in Navajo County, Arizona. Referred to as the Dry Lake Wind Project (Project), IBR's proposed facilities would be located approximately 6 to 18 miles north-northwest of the City of Snowflake, just east of Arizona State Highway 377 and southwest of the U.S. Interstate 40 corridor (Figure 1-1). The Project would provide up to 378 megawatts (MW) of wind energy and consist of multiple phases:

- Phase I would include 64 MW of wind energy with up to 30 wind turbines (project maps display 30 proposed and 8 alternate turbine locations), access roads, an interconnect substation, an Operations & Maintenance (O&M) facility, and collector lines to transmit the generated energy to the substation. The turbines would range in size from 1.5 to 3.0 MW each.
- Subsequent phases would include comparable facilities able to provide a total of up to 314 MW of additional wind-generated energy. Because turbines used in the subsequent phases would also range in size between 1.5 and 3.0 MW, the total number of turbines for subsequent phases of the Project would be between 105 and 209.

The turbines, access roads, collector lines, substation and O&M facilities would be constructed on private leased land, Arizona state lands, and lands administered by the U.S. Department of the Interior, Bureau of Land Management (BLM).

1.2 Purpose and Need for the Proposed Action

Recent national and regional electrical demand forecasts predict that the use of electrical energy will continue to increase into the foreseeable future and will require development of new energy sources to satisfy the growing demand. The U.S. Department of Energy, Energy Information Administration (EIA) is forecasting a 1.6 percent annual growth in electricity sales through 2030 (EIA 2007). This growth will require an increase in generating capacity of 347 gigawatts nationwide over the next 25 years – about 1.1 percent of which is projected to come from wind-generated power. The State of Arizona has recognized the need for new and diverse energy sources in the region and acknowledged the public benefits of renewable generation by putting in place a statewide Renewable Portfolio Standard that includes a stated renewable energy goal of 15 percent by 2025. To help meet this need, IBR has proposed the Dry Lake Wind Project.

BLM is responsible for processing applications for grants of Right-of-Way (ROW) for use of federal lands administered by the BLM. This requires completing environmental reviews pursuant to the National Environmental Policy Act of 1969 (NEPA) [42 United States Code (USC) 4332]. Further, the BLM is responsible for reviewing wind energy projects in relation to its Wind Energy Development Program. The BLM established this program to address increased

interest in wind energy development and to implement national energy policy that calls for increasing renewable energy production on federal lands (NEPDG 2001) – a program that was approved through the BLM's 2005 *Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States* (Wind Energy PEIS) and associated Record of Decision (ROD).

Ultimately, the purpose of this Environmental Assessment (EA) is for the BLM to evaluate and consider whether granting a ROW to IBR for developing the Dry Lake Wind Project on public lands – the Proposed Action – can be completed in an environmentally sound manner and is consistent with the policies of its Wind Energy Development Program. Consistent with NEPA, the BLM prepared this EA to provide sufficient evidence and analysis for: 1) determining whether to prepare a more detailed environmental impact statement; or 2) making a finding of no significant impact.

1.3 RELATIONSHIP TO STATUTES, REGULATIONS OR OTHER PLANS OR POLICIES

1.3.1 BLM Plans and Policies

Federal lands in the Project area are administered by the BLM and managed under the *Proposed Phoenix Resource Management Plan and Final Environmental Impact Statement* (BLM 1988). BLM staff determined that the Proposed Action conforms with the Phoenix Resource Management Plan and Final Environmental Impact Statement (RMP/FEIS). The decision to accept and process an application for a ROW permit on public lands for the Dry Lake Wind Project is in conformance with the Phoenix RMP/FEIS, the specific citation from page 14 of the Phoenix RMP/FEIS being:

> "Land Use Authorizations (rights-of-way, leases, permits, easements) would continue to be issued on a case-by-case basis and in accordance with the recommendations in this Proposed RMP/FEIS. Rights-of-way would be issued to promote the maximum utilization of existing right-of-way routes, including joint use whenever possible."

The Project would not involve construction of a new transmission corridor, would not conflict with BLM vegetation or wildlife management protocols, and would not affect any special management areas.

In addition to the Phoenix RMP/FEIS, the Proposed Action would also be considered in relation to the BLM's Wind Energy Development Program policies and Best Management Practices (BMPs). This program was evaluated in the Wind Energy PEIS (BLM 2005), a programmatic evaluation that identified the range of potential impacts and relevant mitigation measures that would need to be incorporated into project-specific Plans of Development and ROW authorization stipulations for wind energy project on BLM-administered lands. While the EA for the Dry Lake Wind Project tiers off the Wind Energy PEIS, incorporating appropriate

procedures, plans, and impact mitigation techniques required in the BLM's Wind Energy Development Program, it is a stand-alone and specific assessment of the Project.

On March 31, 2006, the BLM issued IBR a ROW grant for preliminary testing and monitoring associated with the Project (Serial Number AZA-33259). If the BLM issues a ROW grant for the Project, the BLM would only issue a final Notice to Proceed with construction of each phase of the Project after final versions of all procedures, plans, and impact mitigation techniques required in the BLM's Wind Energy Development Program, and specific to each phase of the Project, have been reviewed and approved by the BLM's Authorized Officer.

1.3.2 Arizona Right-of-Way Application

IBR applied for a ROW permit from the Arizona State Land Department for facilities located on state lands in October 2005.

1.3.3 Navajo County Special Use Permit

IBR received a special use permit from the Navajo County Planning and Zoning Commission to construct and operate a wind energy project in the general Project area on December 15, 2005. This permit applies to an early configuration of the currently proposed Project. IBR would request an amendment to this special use permit prior to beginning construction of Phase I.

1.3.4 Transmission Interconnection

IBR is in the process of entering into an Interconnection Agreement with Arizona Public Service (APS) to interconnect with the existing Cholla-Zeniff-Show Low 69 kilovolt (kV) transmission line for Phase I of the Project, and with the Cholla-Snowflake-Show Low 69 kV line for 64 MW of a subsequent phase. The Interconnection Agreement would guarantee interconnection capacity for the power generated by Phase I. Subsequent phases of the Project would require additional interconnection agreements with APS, and would depend on additional interconnection capacity from proposed APS transmission projects in the area.

APS is currently proposing to build a 69/500 kV APS Second Knolls Substation near the eastern portion of the Project, as well as a new 69 kV transmission line. After Phase I of the Project is completed, existing transmission line infrastructure in the area has capacity for an additional 64 MW of wind energy. So of the 314 MW of wind energy generated by subsequent phases of the Project, APS would have to complete the upgrades to its system planned for 2009 to accommodate anything beyond 64 MW (i.e., electric transmission capacity for the remaining 250 MW of wind energy would require the APS upgrades).

1.3.5 Other Plans and Procedures

The U.S. Fish and Wildlife Service (USFWS) developed its *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (USFWS 2003). IBR considered these guidelines in developing the Project. Furthermore, IBR and the BLM coordinated with the appropriate USFWS office as part of the NEPA and Endangered Species Act (ESA) consultation processes

for this Project. Additionally, the Division of Natural Resources of the Arizona State Land Department (ASLD) was also contacted.

1.4 AUTHORIZATIONS, PERMITS, REVIEWS, AND APPROVALS

The Project would conform to all relevant federal, state and local statutes, regulations, and plans. Table 1.4-1 lists the anticipated authorizations, permits, reviews, and approvals. IBR would also work with landowners to develop agreements for any project facilities located on private lands. Additionally, IBR is negotiating an interconnection agreement with APS.

Table 1.4-1
Anticipated Authorizations, Permits, Reviews, and Approvals

Agency	Permit/Approval	Status
Federal		
Bureau of Land Management	Environmental Assessment/ Right-of-Way Authorization	To be obtained
Federal Aviation Administration	Notice of Proposed Construction or Alteration within 6 miles of Public Aviation Facility and structures over 200 ft (61 meters) to complete a 7460 Proposed Construction or Alteration Form	In process
U.S. Army Corps of Engineers	Section 404 Permit	To be obtained if applicable
State of Arizona		
Arizona State Land Department	Right-of-Way Permit	To be obtained
Arizona Department of Environmental Quality	Arizona Pollutant Discharge Elimination System Permit	To be obtained
	Section 401 Water Quality Certification	To be obtained if applicable
Arizona Department of Transportation	Utility Access Permit	To be obtained
	Highway Access Permit	To be obtained
	Oversize and Overweight Permit	To be obtained
Local Permits		
Navajo County	Special Use Permit	Obtained 12/15/2005; amendment to be obtained
	Utility Access Permit	To be obtained
	Highway Access Permit	To be obtained

Agency	Permit/Approval	Status
	Oversize/Overweight Transportation Permit	To be obtained

CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

To develop a project that is both economically and technically feasible, wind energy project proponents follow a step-wise siting process that weighs alternatives – both at the level of general location and specific layout.

Included below are the siting criteria used to identifying general project locations. Each of these criteria needs to be satisfied for the Project to be economically and technically feasible and practical.

High quality wind resource. The siting of large-scale wind energy facilities is constrained by the need for a location with sufficient wind speeds on a regular basis throughout the year given current turbine technologies. The lack of a suitable wind resource could lead to operational problems and a lower return on investment.

Although Arizona does not have the wind power resources of many other central or western states, wind resources appear developable – particularly along the Mogollon Rim, the southern rim of the Colorado Plateau (BLM 2005, NSU 2007). IBR has gathered and studied wind resources in the Project area and concluded that the proposed site can be commercially developed.

Available land. Land must be available for a large-scale wind energy project. Land owners and/or administrators must be willing to negotiate lease agreements or otherwise allow the use of the land for wind turbines and associated facilities. Existing land uses must not conflict with wind energy facilities. Residential or urban lands, Wilderness Areas, Wilderness Study Areas, National Parks and Monuments, and National Conservation Areas are examples of land uses that are not consistent with wind energy development.

Existing land use in the Project area is primarily rangeland. Wind energy is consistent with this land use and would not interfere with grazing or cattle operations. Additionally, land owners and administrators in the area have expressed interest and willingness in assisting development of the proposed Project. Finally, the Project location includes about 75 square miles of land that is potentially available – a large enough area for development of a large-scale wind energy project. Given the checkerboard nature of the land ownership in the area, an efficient project layout would need to include private, state, and federal lands.

Suitable transmission. Large-scale wind energy facilities must be located within a reasonable distance of an interconnection point on a transmission line with sufficient capacity to allow for the economical delivery of power to customers on the transmission grid. A reasonable distance is determined in part by the capital cost of transmission line construction.

As noted previously, the APS system currently could provide up to 128 MW of available capacity in the Project area without the need for any system upgrades and/or the construction of lengthy interconnect facilities. APS is currently proposing to build a 69/500 kV APS

Second Knolls Substation near the eastern portion of the Project, as well as a new 69 kV transmission line. These upgrades would accommodate an additional 250 MW of wind energy proposed as part of this Project by 2009.

No Significant Environmental Issues. Large scale wind energy projects are ideally located in areas that avoid significant environmental issues such as major bird migration pathways, areas of particularly sensitive habitats, or conflicting activities (e.g., airports).

Beginning in 2005, IBR prepared a number of environmental studies in the general Project area to identify significant environmental issues. A literature search of sensitive cultural resources and a baseline ecological study of the area did not identify particularly sensitive environmental features or habitats in the Project area.

The proposed Project location in Navajo County meets all of the siting criteria. Using these siting criteria, IBR has developed and constructed similar-sized wind energy projects throughout the United States. Currently, IBR owns and operates more than 1,600 MW of wind energy facilities across the country.

Per the guidance from the Council on Environmental Quality, alternatives beyond the preferred alternative (the Proposed Action) and the No Action Alternative do not require analysis and documentation in an EA unless an unresolved conflict concerning available resources exists. Because the Project has been designed to avoid and/or minimize environmental impacts, the only alternatives considered in this EA were the Proposed Action and the No Action Alternative.

2.1 PROPOSED ACTION

As currently proposed, the Project would consist of the following facilities (Figure 2-1 and 2-2):

- Wind turbines generators and associated generator step-up transformers. Phase I would consist of facilities able to generate up to 64 MW that are located throughout a 25-sqaure mile area; subsequent phases would consist of facilities able to generate another 314 MW located in an expanded Project area that would total about 75 square miles (25 square miles on the west side, 50 square miles on the east side). Because turbines would range in size between 1.5 and 3.0 MW, the total number of project turbines would be from 126 to 239 (21 to 30 turbines for Phase I; 105 to 209 turbines for subsequent phases).
- Access roads. Existing roads would be temporarily widened or improved or roads would be newly constructed to provide access to facilities during construction and operation of the Project. Depending on the final turbine size and facility layout, Phase I of the Project would include about 12 miles of access roads; subsequent phases could include up to 50 to 99 miles of access roads.
- A 34.5 kV collector cable system linking each turbine to the next and to the Project substation(s). The collector cable system would be primarily underground, but would be overhead for connection of the turbines strings to the substation and where necessary to avoid further ground disturbance. Underground sections would be buried at least three

feet below grade by placing the cable in a trench that is backfilled. Overhead sections would be installed on wooden pole or metal structures.

- One 69/34.5 kV project substation and associated overhead 69 kV switching station to connect to the APS transmission system would be constructed as part of Phase I of the project. Up to two more collector substations would be constructed to connect to the APS transmission system as part of the subsequent phases of the Project.

Phase I would connect to the existing APS Cholla-Zeniff-Show Low line bordering the Project area on the west side. Subsequent phases of the Project are planned on the east side of the Project area, connecting to the existing APS Cholla-Snowflake-Show Low 69 kV line, the proposed 69/500 kV APS Second Knolls Substation, or both.

As part of the Phase I interconnect agreement that will be in place by spring of 2008, IBR will have an additional 64 MW of rights on the APS Cholla-Zeniff-Show Low transmission line. The first of the subsequent phases (Phase II) therefore will consist of anywhere between 64 MW and the full build out of 314 MW, dependent upon the amount available capacity on the 69/500 kV APS Second Knolls substation as well as customer demand. Phase II will be constructed no earlier than 2010. If Phase II does not consist of the full build-out, additional subsequent phases would be built in 2011 or later.

Table 2.1-1 lists the sections in the Project area, all within Navajo County, Arizona.

Table 2.1-1
Project Area Sections

Phase	Township	Range	Private Sections	State-Administered Sections	BLM-Administered Sections
Phase I	15N	19E	25, 35	36	12, 14, 22, 24, 26, 28
	15N	20E	17 (south ½), 19, 21, 29, 31	32	20, 28, 30
	14N	19E	1, 3, 9 (east ½), 10 (west ½), 11, 12 (south ½)	2	4, 10 (east ½), 12 (north ½)
	14N	20E		6	
Subsequent Phases	15N	20E	10-11, 13-15, 15, 23, 25, 27, 34-35	22, 36	12, 24, 26
	15N	21E	7-8, 17, 19, 21, 29, 31, 33	32	18, 20, 28, 30, 34
	14N	20E	1, 3, 11, 13, 15	2, 10, 12, 14	
	14N	21E	3, 5, 7, 9, 15, 17	6, 16, 18	4, 8, 10

Land ownership/management is also illustrated on Figure 2-1.

The proposed layout of Phase I as presented in this EA was modified from the preliminary layout submitted with the initial Grant of ROW application in April 2007. These modifications were made to avoid environmental impacts related to sensitive cultural or biological resources and/or to minimize the potential to encounter geotechnical hazards. The layout of subsequent phases would also be adjusted to avoid sensitive environmental features as site-specific information becomes available. The final Project layout would also be reviewed and approved by the BLM's Authorized Officer prior to issuing a Notice to Proceed with construction of the Project.

2.1.1 Project Components

Wind Turbine Generators

Figure 2-2 shows the site layout for Phase I using 2.1 MW Suzlon turbines, a state of the art turbine in the industry. (Note: Although 38 turbine sites are identified in this figure, Phase I of the Project would involve construction of about 30 of the 2.1 MW turbines – 8 of the turbines shown are substitute locations.) Wind turbine technology is continuing to improve with time, and

the cost and availability of any given turbine type can change from year to year. However, final turbine siting, spacing, and clear areas would be in accordance with industry standards and safety measures and appropriate guidance as laid out in the BLM's Wind Energy PEIS and associated ROD. Prior to issuing a Notice to Proceed, the BLM would review the final turbine siting, spacing and clear areas of Phase I and all subsequent phases to ensure they are within the range of the analysis presented in this EA.

This EA analyzes the General Electric (GE) 1.5 MW machine, Suzlon 2.1 MW machine, and Vestas 3.0 MW machine as representative turbines of each of the respective size classes. Together these turbines span the spectrum of the turbine models in the 1.5 to 3.0 MW range. IBR may select turbines by other turbine vendors in the 1.5 to 3.0 MW range; these turbines may have slightly different hub heights and/or rotor diameters. Regardless of the turbine selected, the hub heights would range between 262 and 344 feet and the rotor diameters would range between 256 and 328 feet. The turbines would be grouped in strings connected by an underground and possibly overhead 34.5 kV electrical collector cable system (see Figure 2-2). Individual turbines and turbine strings would be sited to minimize the length of the access roads and collector cables and to maximize wind exposure. Turbine spacing would be established to minimize wake and array losses within the topographic context of the site.

Table 2.1-2 lists the characteristics of the Project turbines and Figure 2-3 illustrates the dimensions of the three representative turbines.

Table 2.1-2
Wind Turbine Characteristics

Characteristic	Turbine		
	GE 1.5 MW	Suzlon 2.1 MW	Vestas 3.0 MW
Nameplate capacity	1,500 kW	2,100 kW	3,000 kW
Hub height	262 ft (80 m)	262 ft (80 m)	262 to 345 ft (80 to 105 m)
Rotor Diameter	256 ft (78 m)	289 ft (88 m)	295 ft (90 m)
Total height[1]	390 ft (119 m)	407 ft (124 m)	410 to 493 ft (125 to 150 m)
Cut-in wind speed[2]	6.7 mph (3 m/s)	8.9 mph (4 m/s)	8.9 mph (4 m/s)
Rated capacity wind speed[3]	26.4 mph (11.8 m/s)	31.3 mph (14 m/s)	33.6 mph (15 m/s)
Cut-out wind speed[4]	45 mph (25 m/s)	45 mph (25 m/s)	45 mph (25 m/s)
Maximum sustained wind speed[5]	Over 100 mph (45 m/s)	Over 100 mph (45 m/s)	Over 95 mph (42.5 m/s)
Rotor speed	10.1 to 20.4 rpm	15.1 to 17.7 rpm	9.9 to 18.4 rpm

[1]Total height = the total turbine height from the ground to the tip of the blade in an upright position
[2]Cut-in wind speed = wind speed at which turbine begins operation
[3]Rated capacity wind speed = wind speed at which turbine reaches its rated capacity
[4]Cut-out wind speed = wind speed above which turbine shuts down operation
[5]Maximum sustained wind speed = wind speed up to which turbine is designed to withstand

Other specifications of the turbines include:

- rotor blade pitch regulation;
- gearbox with three-step planetary spur gear system (1.5 and 2.1 MW) and a two-stage planetary gear and a one-stage helical gear (3.0 MW);
- double fed three-phase asynchronous generator (1.5 MW) and an asynchronous four-pole generator with a wound rotor (2.1 and 3.0 MW);
- a braking system for each blade and a hydraulic parking brake (disc brake); and
- electromechanically driven yaw systems.

Some of the turbines being considered also incorporate new technology compared to turbines currently in the landscape, including:

- force-flow bedplates (nacelle components joined on a common structure to improve durability);

- permanent magnet generators (providing higher efficiency at lower wind speeds); and
- new gearbox bearing designs (improving reliability by reducing bending and thrust).

Each tower would be secured by an underground concrete foundation that can vary in design depending on the soil conditions. Geotechnical surveys and turbine tower load specifications dictate final design parameters of the foundations. Commonly foundations would be octagonal spread-footing designs that are about 60 feet in diameter and 7 to 10 feet in depth. The foundation would be below ground. The tower would be anchored to the foundation. A control panel inside the base of each turbine tower houses communication and electronic circuitry. Each turbine is equipped with a wind speed and direction sensor that communicates to the turbine's control system to signal when sufficient winds are present for operation. The turbines feature variable-speed control and independent blade pitch to assure aerodynamic efficiency.

Turbines would be lit per Federal Aviation Administration (FAA) requirements. One third to one half of the turbines would be lit with white or red flashing lights that would be visible from the state highways at night The FAA lights will be placed at hub height on the turbine nacelles at the end and middle of turbine strings, as specified in the FAA determination letters.

Tower

The towers are conical tubular steel with a hub height of 262 to 345 feet. The turbine towers, where the nacelle is mounted, consist of three to four sections manufactured from certified steel plates. Welds are made in automatically controlled power welding machines and ultrasonically inspected during manufacturing per American National Standards Institute (ANSI) specifications. All surfaces are sandblasted and multi-layer coated for protection against corrosion. Access to the turbine is through a lockable steel door at the base of the tower. Four platforms are connected with a ladder and a fall arresting safety system for access to the nacelle.

Lightning Protection

The entire turbine is equipped with a lightning protection system. The turbine is grounded and shielded to protect against lightning. The grounding system would be installed during foundation work and must be accommodated to local soil conditions. The resistance to neutral earth must be in accordance with local utility or code requirements. Lightning conductors are placed in each rotor blade and in the tower. The electrical components are also protected.

Meteorological Towers

One or two permanent meteorological towers would be installed on the property for Phase I. The towers would be free standing and approximately 197 feet high. The towers would have a concrete foundation and be of a lattice design. No guy wires would be necessary. The towers would be located about 500 to 1,000 feet upwind of the turbine strings – one in the southwestern corner of the Project area and one (if needed) in the northwestern corner of the Project area.

One or two permanent sonic detection and ranging system (SODAR) units could also be placed on site within fenced-in enclosures. These units measure the wind profile from 49 feet up to 656 feet in 32-foot increments. The units measures approximately 9 feet high, 6 feet wide and 10 feet long. These units would be located about 500 feet from the meteorological towers.

Subsequent phases are expected to have similar permanent meteorological tower and SODAR unit requirements (i.e., one or two permanent meteorological towers per phase). For purposes of this EA, it was conservatively assumed that there would be no more than one meteorological tower and SODAR unit per 32 MW of wind turbines. This equates to 10 meteorological towers and SODAR units for the subsequent phases of the Project. Additionally, a similar number of temporary meteorological towers could be needed prior to construction to gather local wind data useful in turbine siting.

Electrical Collection and Distribution System

The Project's electrical system would consist of three key elements:

- a collector system, which would collect energy generated at 575 volts from each wind turbine, increase it to 34.5 kV through a pad-mounted transformer, and deliver it to the Project substation;
- the Project substation, where the voltage is increased from 34.5 kV to 69 kV; and
- the switching station located adjacent to the Project substation connecting into a utility transmission line.

Project Substation

The location of the Project substation for Phase I is shown on Figure 2-2, in the northwest ¼ of Section 3, Township 14N, Range 19E. The substation and switching station would occupy approximately 2 acres of land. The substation site would be surrounded by a graveled, fenced area with transformer and switching equipment and an area to park utility vehicles.

Subsequent phases would likely involve constructing one or two other Project substations that would connect to the existing APS Cholla-Snowflake-Show Low 69 kV line, the proposed 69/500 kV APS Second Knolls Substation, or both (located within the eastern portion of the Project area). Subsequent Project substations would be of similar design and size as the Phase I substation and be sited to be close to an existing transmission line and minimize resource disturbance.

Operations and Maintenance Facility

A pre-engineered 5,000 square foot metal building, including foundation, heating/air-conditioning system, and electrical systems, would be constructed for storage of critical spare parts and maintenance services, within a 4-acre cleared area. The location of the O&M building is shown on Figure 2-2, in the northeast ¼ of Section 3, Township 14N, Range 19E on property

leased from a private landowner. The O&M building would have a septic system and well to provide potable water. The septic system would be a leach field design, typical to the region. IBR would obtain appropriate state and local permits before drilling the well. The well would be approximately 600 feet deep and provide less than 1,000 gallons of water per day. There would be no need for IBR's O&M staff to live permanently on site.

Subsequent phases of the Project would require a second O&M facility located closer to State Highway 77. The second O&M facility would be similar to the original O&M facility. The location of the second substation would be determined as part of the preliminary layout design of subsequent phases, which would occur following further meteorological data collection. The location would be selected to minimize or avoid impacts on sensitive cultural resources, native vegetation, wildlife, wetlands, and floodplains.

Communications System

A supervisory, control, and data acquisition (SCADA) system would be used for the Project to collect operating and performance data from each wind turbine and the Project as a whole, and provide remote operation of the wind turbines. The SCADA systems would be contained within the Project facilities described above.

In addition to providing wind farm control, the SCADA system offers access to wind turbine generation or production data, availability, meteorological, and communications data, as well as alarms and communication error information. Performance data and parameters for each machine (generator speed, wind speed, power output, etc.) can also be viewed, and machine status can be changed. There is also a snapshot facility that collects frames of operating data to aid in diagnostics and troubleshooting of problems. The wind turbines would be linked to a central computer via a fiber optic network. The host computer is expected to be located in the O&M building at the facility site. The SCADA software consists of applications developed by the turbine manufacturer or a third-party SCADA vendor.

The primary functions of the SCADA are to:

- control and monitor the wind farm;
- alert operations personnel to wind farm conditions requiring resolution;
- provide a user/operator interface for controlling and monitoring wind turbines;
- collect performance data from turbines;
- monitor field communications;
- provide information on wind turbine performance for O&M personnel;
- collect data on wind turbine and wind farm maintenance;
- serve as an information archive;

- provide spare parts inventory control; and
- generate operations and maintenance reports.

Roads

Permanent roads would be 16 to 20 feet wide. Where possible, access roads shall be located to follow natural contours and minimize side hill cuts. Roads would be surfaced with aggregate where necessary. As part of Phase I, IBR identified preliminary access road locations. Phase I of the Project would include about 12 miles of access roads; subsequent phases could include up to 50 to 99 miles of access roads. To the extent feasible, access roads would follow existing roads in the area. An access road siting and management plan has been developed, which incorporated existing BLM standards regarding road design, construction, and maintenance such as those described in the 2005 Wind Energy PEIS and ROD (BLM 2005), BLM 9113 Manual (BLM and USFS 1985) and the Surface Operating Standards for Oil and Gas Exploration and Development (Fourth Edition 2006) (i.e., the Gold Book). The final access road siting and management plan will be reviewed and approved by the BLM's Authorized Officer before the BLM would issue a Notice to Proceed with Project construction.

2.1.2 Construction of the Project

It is expected that each phase of Project construction would occur over a period of approximately 9 to 12 months from the time the BLM issues a Notice to Proceed for that phase to commercial operation. Depending on turbine availability and other commercial factors, Phase I of the Project could be built in 2008 or a subsequent year.

Construction of the Project would follow BLM BMPs that may be supplemented based on input from BLM staff in all permitted activities. Those BMPs were designed to mitigate specific issues identified in project-specific field studies as part of the requirements for environmental clearance for the Project per NEPA. The BLM would require a financial bond for the portion of the Project on BLM-administered public lands to ensure compliance with the terms and conditions of the ROW authorization and the requirements of applicable regulatory requirements, including reclamation costs.

IBR would utilize engineering practices that limit disturbance and related impacts on the surrounding environment and land uses. Erosion control practices would be utilized in areas impacted by proposed construction per requirements of the Arizona Pollutant Discharge Elimination System (AZPDES) permit. This would include preparing an implementing a Project-specific Stormwater Pollution Prevention Plan (SWPPP) to prevent off-site migration of contaminated storm water or increased soil erosion. IBR developed a SWPPP that was included in its Plan of Development and submitted to the BLM. Additionally, IBR (or its contractors) would develop a Spill Prevention, Control and Countermeasure Plan (SPCC Plan) that would identify:

- where hazardous materials and wastes (e.g., construction equipment fuel, oils, lubricants) would be stored on site;
- spill prevention measures to be implemented;
- training requirements;
- appropriate spill response actions for each material or waste used on site;
- the locations of spill response kits on site;
- procedures for ensuring that the spill response kits would be adequately stocked at all times; and
- procedures for making timely notifications to authorities in the event of a hazardous material spill.

All personnel would be trained in mitigation methods suitable for the Project. Overall planning and design of the Project would stress minimizing negative environmental impacts. The final SPCC Plan would be reviewed and approved by the BLM's Authorized Officer before the BLM would issue a Notice to Proceed with Project construction.

Construction would involve the following tasks:

- constructing roads, excavating for turbine transformer foundations, and leveling areas for setting the erection crane;
- performing dust and erosion control;
- pouring foundations for wind turbine and meteorological tower;
- trenching for underground utilities;
- placing underground electrical and communications cables in trenches;
- transporting tower sections to the site and erecting the towers;
- installing the nacelle and rotor on the wind turbine tower;
- constructing the Project substation and switching station;
- constructing the O&M building;
- commissioning and testing wind turbines; and
- conducting final road grading, final erosion control, and site cleanup.

The amount of land disturbed by construction of the Project is summarized in Table 2.1-3. IBR estimates that between 8,000 and 20,000 gallons of water would be needed for construction of each turbine. This includes about 8,000 to 9,000 gallons of water for cement used in foundation construction and 11,000 to 12,000 gallons of water for dust control and other construction uses. Water needed for dust control, the concrete batch plant, or other construction activities would be obtained from an existing onsite well in cooperation with a participating landowner.

Pre-Construction Activities

Pre-construction activities would be limited to the maintenance of temporary meteorological towers and field surveys necessary to support environmental studies/analysis. IBR would not initiate any construction on BLM lands until after issuance of a written Notice to Proceed from the BLM. IBR would conduct all activities within the authorized limits of the final ROW approved by the BLM.

Prior to beginning any construction work, any remaining field investigations that have not already been conducted would be conducted within areas anticipated to be disturbed (including temporary construction disturbances) to assist in identifying any environmentally sensitive areas (i.e. archaeological sites, fragile watersheds, areas with threatened and endangered species). These areas would be avoided and not included in the ROW and/or mitigated as appropriate and as approved by the BLM. In addition, the construction workforce would be trained to identify and avoid all areas not included within the ROW. Special efforts would be made to flag sensitive areas to minimize the potential for accidental disturbance from construction equipment and crews.

Geotechnical testing and studies will be completed for subsequent phases to test for stability issues, soil conductivity, soil compaction potential, and geologic site conditions and hazards which possess potential for damage to structures and improvements. Based on the results, appropriate strategies and approaches to the proposed subsequent phases of the Project can be developed, including final locations of wind turbines and foundations types best suited to the site subsurface conditions.

Construction Activities

Clearing and Grading

Excessive grades on roads, road embankments, ditches, and drainages would be avoided to the extent possible, especially in areas with erodible soils. Road gradients would not exceed 8 percent except for pitch grades (300 feet or less in length) in order to minimize environmental effects. Special construction techniques would be used, where applicable, to avoid and minimize erosion, as described in the following sections. Access roads and on-site roads would be surfaced with aggregate materials, wherever appropriate.

When deemed necessary and where there is substantial potential for compaction (e.g., construction areas around the base of the turbines, temporarily widened access roads, the batch plant site), topsoil materials would be stripped and temporarily stockpiled for later use in restoration.

Project facilities would avoid xeroriparian areas, to the greatest extent practicable, and be designed so that changes to surface water runoff are avoided and erosion is not initiated. Soil

erosion would be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly.

Blasting

In rocky areas, controlled blasting may be used to loosen rock before the trench is excavated. All procedures identified by the BLM for conducting such work as well as applicable federal and state regulations would be followed. Explosives would only be used within times and at specified distances from sensitive wildlife or surface waters, as established by the BLM or other federal and state agencies. A blasting plan was included in the Plan of Development and submitted to the BLM.

Road Construction

A permanent road ROW, about 16 to 20 feet wide, would be located along the proposed access roadways. To allow the large erection crane to travel from turbine site to turbine site, the road ROW would temporarily be 35 feet wide and restored to 16 to 20 feet wide after construction is completed. All road construction activities would remain within the road ROW granted by the BLM and the State of Arizona. For purposes of this analysis, it was assumed that each turbine would require approximately 2,159 ft of access road.. As such, Phase I and the subsequent phases would require between 262,500 ft and 522,500 ft (assumes 2,500 ft of access road per turbine). This is a conservative estimate of disturbances for subsequent phases since Phase I only requires 2,159.2 ft of access road per turbine and existing unpaved roads would be used whenever possible.

An access road siting and management plan was prepared for Phase I of the Project (and will be developed for subsequent phases), incorporating existing road design, construction, and maintenance standards such as those described in the Wind Energy PEIS and ROD (BLM 2005), BLM 9113 Manual (BLM and USFS 1985) and the *Surface Operating Standards for Oil and Gas Exploration and Development* (Fourth Edition 2006) (i.e., the Gold Book). The size and nature of wind turbine components and cranes would likely require some modifications to the Gold Book standards. If road grade and/or runoff patterns indicate, added erosion control measures, such as water bars, would be installed to minimize erosion, described in the Project's SWPPP.

Staging Areas

A temporary 2-acre staging area would be located at the beginning of each turbine string during construction. Additionally, Project construction could also require a single temporary 8-acre staging area and portions of the 4-acre O&M site to stage and/or store construction equipment and materials. The location of the staging area would likely be adjacent to the O&M site. During construction, the staging areas would be fenced and gated to control access and to limit damage or theft of stockpiled material and equipment. The ground within the fencing may be graveled depending upon site soil conditions.

Foundation Construction and Tower Erection

Site pads would be constructed for each wind turbine. Each pad may have unique characteristics regarding size and construction in order to address site topography. Each pad would require an approximately 200 foot radius area to be temporarily cleared and leveled to a maximum 5 percent slope. The cleared pad area is required for the assemblage of wind turbine sections and construction cranes, which would be utilized to hoist the sections into place. Within this 200-foot radius, a compacted area measuring 40 feet by 120 feet with a maximum slope of 1 percent is required to support the heavy crane used for turbine erection. The construction crane pad would not be surfaced; however, the underlying soils would be compacted to provide a minimum soil bearing capacity of 6,000 pounds per square foot in order to provide a stable foundation for safe operation of the crane. In tower locations where this is not feasible, crane mats would be used to stabilize the crane.

The amount of soil compaction required would be determined from geotechnical studies; however, dynamic compaction could be required (the systematic dropping of heavy weights). If it is necessary, a crane would be used to meet compaction standards for the turbine foundation pads by systematically dropping heavy weights, and graders and bulldozers would be used to achieve the required levels on roads.

The wind turbines' freestanding tubular towers would be connected by anchor bolts to a concrete foundation. Foundation design for the turbines would be based on project-specific geotechnical investigations and design. For the range of turbine sizes proposed, typically IBR uses spread-footing type foundations that are about 60 feet in diameter and 7 to 10 feet in depth (only a short foundation pedestal would be aboveground). Each wind tower location would have soil borings performed to ensure sufficient soil-bearing capacity. A licensed geotechnical engineer would analyze and recommend specific requirements to ensure adequate foundational strength for each of the proposed wind power generation towers. Reinforced concrete foundations would be placed according to manufacturer's and geotechnical engineer's recommendations.

The permanent foundations for the wind generator towers would be excavated, compacted, and constructed of structural concrete with appropriate steel reinforcement as directed by the tower supplier. Additionally, the ground immediately around the tower would be surfaced with gravel, for a radius of approximately 40 feet. This permanent surfacing would provide a stable surface area for maintenance vehicles, and would minimize surface erosion and runoff from the pad areas.

The concrete foundations would be constructed using concrete from an on-site batch plant described below.

Batch Plant

A temporary batch plant would be needed to mix the concrete for the foundations of the turbine towers, substation, and O&M facility for Phase I and each subsequent phase of the Project. The entire batch plant would consist of a mixing plant and areas for aggregate and sand stockpiles, driveways, and truck load out and turnaround. The mixing plant would include cement storage silos, water and mixture tanks, aggregate hopers, and conveyors and augers to deliver different materials to the mixing plant. Each batch plant would require an area about 300 by 500 feet (3.5 acres). A typical layout for a batch plant is illustrated on Figure 2-4. To minimize construction traffic, the batch plant would be located on-site at a location that maximizes site efficiency – likely at the proposed O&M building site.

The batch plant site would be prepared by first stripping the site of topsoil (the topsoil would be stabilized adjacent to the batch plant site for later use in restoration). Next the site would be graded and the subsoil would be compacted. Prior to erecting the mixing plant components, the site would be covered with about 6 inches of gravel.

Aggregate and sand would be sourced from one or more existing local and permitted quarries. After being trucked to the batch plant, the aggregate and sand would be placed into stockpiles. Cement, obtained from the nearby vendors, would also be delivered by truck and stored in silos. Approximate quantities for raw materials needed for each installed MW of the Project would include:

- sand – 250,600 pounds
- aggregate –381,400 pounds
- cement – 112,200 pounds

Water would be obtained from an existing onsite well in cooperation with a participating landowner. A total of about 390,000 gallons of water would be needed for mixing cement for Phase I of the Project (about 8,000 to 9,000 gallons per turbine foundation).

During Project construction, aggregate and sand would be taken from stockpiles and dumped into hoppers with front-end loaders. Cement, aggregate, sand, water, and admixtures would be mixed together in the mixing plant and then loaded into ready mix trucks in the truck loading area. The concrete would then be delivered throughout the site as needed with ready mix trucks. As the trucks are unloaded, they would be washed out within the excavation pit for the tower foundations.

Within one year of completing construction, the batch plant(s) would be removed and the entire site would be reclaimed. This would include removing the gravel, regrading and decompacting the subgrade, replacing the topsoil, reseeding, and applying any temporary erosion control measures.

Electrical Collector System Lines

A 34.5-kV underground or overhead electrical collector system would need to be constructed to connect the turbines to the Project substation. The electrical collector system would be underground, except where site-specific considerations require the collector system be placed aboveground (overhead) to reduce habitat disturbances that would otherwise result from construction. Based on the preliminary collector cable layout of Phase I of the Project, all Project collector cables would be placed underground. Each turbine would require about 1,967 ft of collector line; Phase I will require 59,001 ft (11 miles) of collector line and the subsequent phases would require 273,000 ft to 543,400 ft (52 to 103 miles) of collector line (assumes 2,600 ft of collector line per turbine for subsequent phases). This is a conservative estimate for subsequent phases since Phase I only requires 1,967 ft of collector line per turbine (see Table 2.1-3). Final geotechnical analyses would be completed prior to construction and would be used to determine how much overhead collector systems would be needed.

Underground electrical and communications cables would be placed in a 3- to 5-foot-wide and 3- to 5-foot-deep trench, generally along the length of the proposed turbine access roads. Electric distribution and communications cables would be placed in the trench. Electrical cables would be installed first and the trench partially backfilled before placement of communications cables. The topsoil in the trench would be stripped and set aside, then the trench would be backfilled and topsoil would be replaced on top. In rocky areas, controlled blasting may be used to loosen rock before the trench is excavated. Explosives would only be used within specified times and at specified distances from sensitive wildlife habitats (e.g., active raptor nests). Blasting would not scatter rock more than a few yards from the excavation site.

Concrete or fiberglass vaults and splice boxes would be placed belowground at locations as needed. Boxes would be secured from access to the public by locking lids. The vaults would be about 5 by 5 by 8 feet. The distance between the vaults would vary based on the size of wire used; however, the vaults would be a minimum of 2,500 feet apart. Vaults would only be used when required to span long distances – it is likely that no vault would be needed between each turbine.

All areas disturbed during trenching for underground lines would be reseeded with native grasses in accordance with the Habitat Restoration Plan (Appendix D).

In order to minimize surface disturbances, the electric collector system could be placed aboveground (overhead) in some locations where the electrical and communications cables would be strung from poles. Using aboveground structures would allow the collector cables to "span" intermittent washes and areas where extensive excavation through rock would otherwise be required. The use of aboveground poles for stringing the electrical cables would reduce habitat disturbances as allowed by the Wind Energy PEIS (page 2-19: "Overhead lines may be used in cases where burial of lines would result in further habitat disturbances"). The overhead

pole structures used for stringing the aboveground electrical collector system would be steel or wood and generally be about 60 to 80 feet tall with taller heights required to cross washes or drainages (see Figure 2-5 for an example).

IBR would design all aboveground transmission line support structures following the practices suggested by the Avian Powerline Interaction Committee (APLIC 1996). When poles from the aboveground collector system are located within 0.5 mile of turbines, IBR would install anti-perching devices on transmission pole tops and cross arms.

Project Substation

Each phase's substation is anticipated to occupy an approximately 2-acre site. Construction would generally consist of concrete pads and electric transformers. Areas not covered by concrete pads would be surfaced with gravel to minimize erosion and surface runoff. The substations would be fenced with chain link security fencing to minimize the potential for entry by non-authorized personnel. The substations would be sited in upland areas to avoid impacts on floodplains or xeroriparian vegetation and other sensitive environmental features.

Fences

Temporary security fencing would be located around construction staging areas. It is anticipated that this fencing would be a 6 foot high chain link structure with additional security wiring located at the top. When construction is complete, the fencing around the staging areas would be removed and the staging area returned to a natural state.

Permanent security fencing would be installed around the perimeter of the substation and the maintenance building area. Where any existing rangeland fence still in use is cut or otherwise damaged in the course of construction of the proposed roadway and pad sites, IBR would rebuild and or replace the structure in accordance with BLM or state specifications or private landowner directions.

Site Cleanup and Restoration

After construction is complete, IBR would work to restore disturbed areas to pre-construction standards. Restoration would occur as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to preconstruction conditions. Topsoil from excavations and other construction activities would be segregated from sub-soil and reapplied to the surface of the ground during reclamation. In order to reestablish plant communities of most value to wildlife, the appropriate native grasses would be used. Additional reclamation measures would be developed to address site-specific conditions as necessary.

IBR would implement its Habitat Restoration Plan (Appendix D) to avoid, minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan identifies revegetation, soil stabilization, and erosion reduction measures that

would be implemented to ensure that all temporary use areas are restored. The plan stipulates that restoration occur as soon as reasonably possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.

Personnel and Communications Requirements

During the 9- to 12-month construction period for each project phase, up to 200 workers would be employed. During the construction phase, potable water and sanitary facilities would need to be established to support the construction crews. Construction requires an average of about 120 truck trips on area highways for each turbine and associated facilities. Subsequent phases are expected to have similar personnel requirements and construction schedules.

IBR's Plant Manager and on-site contractors would carry radios in order to be reached for emergencies, and the O&M building constructed for Phase I of the Project (located off Arizona State Highway 377 in the northeast ¼ of Section 3, Township 14N, Range 19E) would serve as the communication center. Specific phone numbers for Project personnel would be provided to the BLM. Operation of radio units would comply with Federal Communication Commission's rules and regulations.

2.1.3 Project Maintenance

When the Project is operational, there would be 5 to 10 permanent full-time or part-time employees on the O&M staff. It is expected that the Project would function for at least 30 years. Equipment would be monitored by local O&M staff and remotely by IBR's operations and power scheduling desk, which is staffed 24 hours per day. When needed, during off hours, local personnel would be dispatched to the site by the remote monitoring staff. Performance testing is done during the early months of operation to see that the wind farm is operating within expected parameters.

The O&M field duties include performing all scheduled and unscheduled maintenance, including periodic operational checks and tests, regular preventive maintenance on all turbines, related plant facilities and equipment, safety systems, controls, instruments, and machinery, including:

- maintenance on the wind turbines and on the mechanical, electrical power, and communications system;
- performance of all routine inspections;
- maintenance of all oil levels and changing oil filters;
- maintenance of the control systems, all structures associated with the wind farm, access roads, drainage systems, and other facilities necessary for the operation of the wind farm;
- maintenance of all O&M field maintenance manuals, service bulletins, revisions, and documentation for the wind farm;

- maintenance of all parts, price lists, and computer software;
- maintenance and operation of interconnection facilities;
- provide all labor, services, consumables, and parts required to perform scheduled and unscheduled maintenance on the wind farm, including repairs and replacement of parts and removal of failed parts;
- assist as needed with avian and other wildlife studies;
- manage lubricants, solvents and other hazardous materials as required by federal, state, and/or local regulations;
- maintain appropriate levels of spare parts in order to service equipment;
- obtain all necessary equipment, including the rental of industrial cranes for removal and reinstallation of turbine components;
- hire, train, and supervise a work force necessary to meet the general maintenance requirements; and
- maintain site security.

IBR would develop "good housekeeping" procedures to ensure that during operation the site would be kept clean of debris, garbage, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards.

Maintenance Schedule

Project inspection and maintenance is performed on the following intervals:

- **First Service Inspection.** The first service inspection would take place one to three months after the turbines have been commissioned. At this inspection, particular attention is paid to tower bolt tensioning and generator alignments.
- **Semi-Annual Service Inspection.** Regular service inspections commence six months after the first inspection. The semi-annual inspection consists of lubrication and a test of the turbine trip system.
- **Annual Service Inspection.** The yearly service inspection consists of a semi-annual inspection plus a full component check including lubrication, replacement of any filters and test of the turbine trip system. Bolts are checked with a torque wrench. The check covers 10 percent of the bolts. If any bolts are found to be loose, all bolts in that assembly are tightened and the event is logged. Electrical terminal connectors are checked and tightened. Additionally, the annual inspection includes an extensive inspection of the wind braking system, checking and testing of oil and grease, and a balance check. Any deficiencies noted outside the regular checklist are also corrected.

2.1.4 Temporary and Permanent Ground Disturbance

The Project is located in a general area encompassing about 75 square miles (25 square miles on the Phase I west side and 50 square miles on the subsequent phases east side). However, the total area of ground disturbance for project facilities within this general Project area is relatively limited. Included in Table 2.1-3 and Table 2.1-4 is an estimate of the ground disturbance during construction (temporary) and operation (permanent) of the Project. Although specific locations for all project facilities have not yet been identified, estimates of ground disturbances were calculated based on the assumptions that turbine spacing and the length of access road/cable per turbine would be similar between Phase I and subsequent phases of the project. Additionally, the ground disturbance estimates are based on the use of turbines of the 2.1 MW class. The operation ground disturbance would be located within (a subset of) the area disturbed during construction.

Table 2.1-3
Disturbed Areas on Private, State, and Federal Lands - Construction

Facilities	Phase I (priv./ASLD/BLM)	Subsequent Phases (priv./ASLD/BLM)	Total (priv./ASLD/BLM)
2.1 MW Turbine[1]			
Turbine Construction/Staging Areas			
staging areas[2]	14.0 acres (10/2.0/2.0)	120.0 acres (69.6/24.0/26.4)	134.0 acres (79.6/26.0/28.4
staging areas at each turbine site[3]	86.5 acres (31.7/23.1/31.7)	302.8 – 602.6 acres (250.9/86.5/95.2)	389.3 – 689.1 acres (282.6/109.6/126.9)
Collector Line Staging and Access Areas			
construction corridor[4]	32.5 acres (11.9/8.7/11.9)	150.4 – 299.4 acres (124.6/43.0/47.3)	182.9 – 331.9 acres (136.5/51.6/59.2)
Roads			
construction access roads between turbines (35-ft-wide)[5]	52.0 acres (19.1/13.9/19.1)	210.9 – 419.8 acres (174.8/60.3/66.3)	263.0 – 471.9 acres (193.8/74.1/85.4)
Total Construction Area	**185.0** acres (72.7/47.6/64.7)	**784.1 – 1,441.8** acres (619.8/213.7/235.1)	**969.1 – 1,626.8** acres (692.6/261.4/299.8)

[1] The final Project layout will not be determined until turbine availability is known and final site selection is complete. These estimates assume a 2.1 MW turbine will be used, and 30 turbines will be installed during Phase I, and 150 turbines would be installed as part of subsequent phases. Acreages are calculated for 30 turbines for Phase I and as a range for 105 turbines to 209 turbines for subsequent phases. However, the breakdown of acreages into private, state, and federal land is not presented as a range; it is based on the 30 turbine assumption for Phase I and 150 turbine assumption for subsequent phases.

[2] Assumes that each turbine string would require a 2-acre staging area; Phase I would require 3 strings and the subsequent phases would require 35 strings. Additionally, one other 8-acre staging area would be required during Phase I and a 50-acre staging area would be required during the subsequent phases. These staging areas would encompass the site needed for the batch plant used for each phase of the Project.

[3] Assumes that each tower would require a 125,600 ft^2 staging area.

[4] Assumes a 24-ft-wide construction corridor. Each turbine will require 1,966.7 ft of collector line; Phase I will require 59,001 ft of collector line and the subsequent phases will require between 273,000 ft and 543,400 ft of collector line (assumes 2,600 ft of collector line per turbine for subsequent phases). This is a conservative estimate for subsequent phases since Phase I only requires 1,966.7 ft of collector line per turbine.

[5] Assumes a 35-foot-wide access road, with each turbine requiring 2,159.2 ft of access road; Phase I will require 64,776 ft and subsequent phases will require between 262,500 ft and 522,500 ft (assumes 2,500 ft of access road per turbine). This is a conservative estimate of disturbances for subsequent phases since Phase I only requires 2,159.2 ft of access road per turbine.

Table 2.1-4
Disturbed Areas on Private, State, and Federal Lands - Operation

Facilities	Phase I (priv./ASLD/BLM)	Subsequent Phase (priv./ASLD/BLM)	Total (priv./ASLD/BLM)
2.1 MW Turbine[1]			
Turbine Pads/Towers (3,600 ft^2 per turbine)	2.5 acres (0.9/0.7/0.9)	8.7 – 17.3 acres (7.2/2.5/2.7)	11.2 – 19.8 acres (8.1/3.2/3.6)
Collector Substation[2]	2.0 acres (2.0/0.0/0.0)	4.0 acres (4.0/0.0/0.0)	6.0 acres (6.0/0.0/0.0)
O&M Facility[3]	4.0 acres (4.0/0.0/0.0)	4.0 acres (4.0/0.0/0.0)	8.0 acres (8.0/0.0/0.0)
Meteorological Towers (self supporting; 900 ft^2 per tower)[4]	<0.1 acre (<0.1/<0.1/<0.1)	0.2 acres (0.1/<0.1/<0.1)	<0.3 acres (0.1/0.1/0.1)
Roads			
access roads (16-ft-wide)[5]	23.8 acres (8.7/6.3/8.7)	96.4 – 191.9 acres (79.9/27.5/30.3)	120.2 – 215.7 acres (88.6/33.9/39.0)
Total Operation Area	**32.4** acres (15.7/7.1/9.7)	**113.3 – 217.4** acres (95.2/30.1/33.1)	**145.7 – 249.8** acres (110.8/37.2/42.7)

[1] The final Project layout will not be determined until turbine availability is known and final site selection is complete. These estimates assume a 2.1 MW turbine will be used, and 30 turbines will be installed during Phase I, and 150 turbines would be installed as part of subsequent phases. Acreages are calculated for 30 turbines for Phase I and as a range for 105 turbines to 209 turbines for subsequent phases. However, the breakdown of acreages into private, state, and federal land is not presented as a range; it is based on the 30 turbine assumption for Phase I and 150 turbine assumption for subsequent phases.

[2] Assumes one 2-acre collector substation site for Phase I and two 2-acre collector substation sites for the subsequent phases.

[3] Assumes one 4-acre O&M site for Phase I and one 4-acre O&M site for subsequent phases.

[4] Assumes one permanent meteorological tower would be installed for each 32 MW of wind turbines.

[5] Assumes a permanent 16-foot-wide access road, with each turbine requiring 2,159.2 ft of access road; Phase I will require 64,776 ft and subsequent phases will require between 262,500 ft and 522,500 ft (assumes 2,500 ft of access road per turbine). This is a conservative estimate of disturbances for subsequent phases since Phase I only requires 2,159.2 ft of access road per turbine.

2.1.5 Decommissioning and Abandonment

Prior to the termination of the ROW authorization, a decommissioning plan would be developed and approved by the BLM. The decommissioning plan would include a site reclamation plan and monitoring program. That plan would be developed in compliance with the standards and requirements for closing a site at the time decommissioning occurs. The design life of the wind project facilities is expected to be at least 30 years. IBR developed a decommissioning plan included in its Plan of Development and submitted to the BLM.

All management plans, BMPs, and stipulations developed for the construction phase would be applied to similar activities during the decommissioning phase. It is anticipated that the requirements in effect at that time would require that all turbines and ancillary structures be removed from the site.

When the O&M facilities are retired or decommissioned, the turbine towers would be removed from the site and the materials reused or sold for scrap. Inert underground electrical cables and underground concrete turbine pads would be left in place, provided landowner permission is obtained, but no such equipment would be left within 3 feet of the ground surface. New or improved roads would be left in place or reclaimed as requested by landowners and the BLM.

Topsoil from all decommissioning activities would be salvaged and reapplied during final reclamation. All areas of disturbed soil would be reclaimed using weed-free grasses as described in the Habitat Restoration Plan (Appendix D). The vegetation cover, composition, and diversity would be restored to values commensurate with the ecological setting.

2.2 No Action Alternative

The No Action Alternative is required to be analyzed under NEPA regulations. For this analysis, the No Action Alternative consists of no ROW grant being issued by the BLM and no wind energy facilities would be constructed on private, state or BLM lands in the Project area. The effects to the environment that would result due to construction of the Project (described in detail in Chapter 3) would not occur as part of the No Action Alternative, and existing land uses in the Project area would remain unchanged. It is purely speculative to predict the resulting actions that could be taken by other energy suppliers or consumers of energy in the region as well as any associated direct and indirect environmental impacts of those actions. Given the projected increase in demand for electricity, it is reasonable to assume that the No Action Alternative would lead to other energy development projects that could have similar or greater environmental impacts in other parts of the state or region.

CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

An environmental impact is a change in the status of the existing environment as a direct or indirect result of the Proposed Action or the No Action Alternative. Impacts can be direct, indirect, or cumulative; positive (beneficial) or negative (adverse); and permanent (long-term) or temporary (short-term). Direct impacts are those that are the result of construction, operation and/or maintenance, whereas indirect impacts generally occur following construction and may not be directly related to the Project. Short-term impacts are generally associated with the construction phase of the Project, while long-term impacts remain for the life of the Proposed Action and beyond. Cumulative impacts are the impacts on the environment which result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions.

Potential impacts on the following Critical Elements of the Human Environment (as defined by the BLM) were considered in this EA:

- Air Quality
- Areas of Critical Environmental Concern (ACEC)
- Cultural Resources
- Environmental Justice
- Farmlands (Prime or Unique)
- Floodplains
- Native American Religious Concerns
- Threatened or Endangered Species
- Wastes (Hazardous or Solid)
- Water Quality (Surface, Ground, and Drinking)
- Wetlands and Riparian Zones
- Wild and Scenic Rivers
- Wilderness

Based on a preliminary analysis, the following Critical Elements would not be adversely affected by the Proposed Action and are not discussed further:

- *ACEC* – A review of the Phoenix RMP/FEIS indicated that there are no designated ACECs within 15 miles of the Proposed Action.
- *Farmland (Prime or Unique)* – A review of the Navajo County Natural Resource Conservation Service Soil Survey indicated that there is no designated prime farmland in the area of Proposed Action; no unique farmlands were identified in the vicinity of the Proposed Action.
- *Native American Religious Concerns* – Discussions with Native American tribes and groups indicated that there are no Native American religious concerns associated with the Proposed Action (see Section 4.4).
- *Wild and Scenic Rivers* - Review of the Phoenix RMP/FEIS indicated that there are no federally-designated Wild and Scenic Rivers in the vicinity of the Proposed Action.
- *Wilderness* - Review of the Phoenix RMP/FEIS indicated that there are no tracts of wilderness, designated Wilderness Areas or Wilderness Study Areas within the vicinity of the Proposed Action.

An analysis of the impacts of the Proposed Action on the remaining Critical Elements of the Human Environment is included in this chapter. Additionally, the following non-critical elements are also analyzed within this EA:

- Geology and Geohazards
- Human Health and Safety
- Invasive and Non-Native Species
- Land Use
- Noise
- Paleontology
- Public Services
- Socioeconomics/Environmental Justice
- Soils
- Vegetation
- Visual Resources
- Wildlife

Measures that would be implemented to avoid, minimize, rectify, or compensate for impacts (mitigation measures) on all of these elements are discussed throughout this chapter. Finally, this chapter also discusses the irreversible and irretrievable commitment of resources and unavoidable impacts.

3.2 GEOLOGY AND GEOHAZARDS

The Project area is in about the middle of the Holbrook Basin of the Colorado Plateau Physiographic Province. The Holbrook Basin is a structural basin covering roughly 8,000 square miles of east-central Arizona. Surficial geology of the site and immediate vicinity consists of outcroppings of two sedimentary rock units; the Moenkopi Formation, with the underlying Coconino Sandstone exposed in drainages (Wilson et al. 1960), as shown in Figure 3-1. These surface rocks are underlain by the Supai Formation. These three rock units are briefly described as follows:

- **Moenkopi Formation (Lower Triassic)** – This rock unit comprises the relatively flat, vast majority of the surface/near surface at the Project area. The unit consists of reddish brown, thinly-bedded shaley siltstone and sandstone about 200 feet thick (Hirschberg and Pitts 2000).
- **Coconino Sandstone (Lower Permian)** – This rock unit comprises a relatively small portion of the surface/near surface at the Project area. Exposures are limited to drainage features where the overlying Moenkopi unit has been eroded. The unit is described as tan to white, cliff-forming, fine-grained, well-sorted, cross-bedded quartz sandstone, about 400 feet thick (Hirschberg and Pitts 2000).
- **Supai Formation (Lower Permian – Upper Mississippian)** – This rock unit underlies the Project area below the Coconino Sandstone. The unit is described as red to reddish-brown clayey siltstone and halite (common table salt) over 1,000 feet thick, with beds of anhydrite, gypsum, and carbonate (Rauzi 2002). The Supai Formation includes a salt bed up to 650 feet thick in the center of the Holbrook basin, pinching out toward the basin margin (Bahr 1962).

The Holbrook Basin has a regional dip of about two degrees, except along its southwestern margin where the approximately 60 mile long surface expression of the Holbrook anticline exists in the form of Pink Cliffs. This is in the southernmost part of the Project area (Figure 3-2). The change in regional dip along the Holbrook anticline is believed to be the result of land subsidence into voids formed by dissolution of the underlying salt beds. Subterranean collapse begins in the beds of dissolved salt and the voids then propagate upward through the Coconino Sandstone (Harris 2002).

Mineral Potential

Neither the Moenkopi nor the Coconino is known to contain ores, and no ore bodies are known to exist in or near the Project area. A statewide mineral potential map by McColly and Anderson (1987) shows no known potential for locatable minerals such as gold, silver, or copper in the Project area. A review of BLM records shows no active federal mining claims within the Project area. Similarly, a statewide potential map for leasable minerals such as coal, oil, and gas by McColly and Anderson (1987) shows no potential for them. Maps issued by the Arizona Oil and Gas Conservation Commission (1987) show about 10 holes have been drilled along the Holbrook

Anticline, mostly in the 1960s and 1970s, and all are dry and nonproductive. A Prospectively Valuable map produced by the BLM indicates potential for oil and gas in the Project area, but the map is based on the total thickness of sedimentary rocks and indicates such potential for nearly the entire Colorado Plateau region, most of the northern third of the state. BLM prospectively valuable maps also indicate potential for sodium and potassium in the Project area. Again, the potential is widespread, covering most of the Holbrook basin, based on the salt beds in the Supai.

Site Conditions

Aerial photographs were used to identify general drainage patterns and locations of major topographic relief such as the Pink Cliffs. Additionally, certain surficial features were observed during a helicopter fly-over of the Project area including prominent ground cracking along and parallel to the Pink Cliffs, sinkholes, large apparently internally-drained depressions south of the Pink Cliffs, and enlarged joints and fractures along and parallel to the northern flank of the Pink Cliffs/Holbrook anticline. A thin layer of soil covers much of the area. Where soils cover jointed and fractured rock, it was clear where the joints and fractures extended beneath the soil as evidenced by linear traces in the soil surface and vegetative growth along their alignments. Surface water likely accumulates in the soil-filled fractures and joints, providing for vegetative establishment and growth.

Faults

The U.S. Geological Survey (USGS) Earthquakes Hazards Program online Quaternary Fault and Fold Database of the United States was searched to identify known faults in the vicinity of the Project area. Based on information contained in this database, three faults or fault systems, for which geologic evidence suggests Quaternary-age (past 1.6 million years) deformation, are located approximately 35-50 miles to the east-southeast of the Project area. All three faults/fault systems were indicated as exhibiting evidence of deformation within the past 750,000 years, with slip rates of less than 0.2 millimeters per year. No other faults were identified within a 50-mile radius of the Project area.

Geologic Hazards

The Arizona Geological Survey (AZGS 2007) identified three geologic hazards considered to have potential to exist at the Project area: flooding, problem soils, and karst topography. Flooding is discussed in Section 3.8 and problem soils in Section 3.34.

Karst Topography

Karst is the term applied to surface topography that develops on land underlain by soluble rocks such as limestone, gypsum, and salt. Karst terrain is characterized by solution features, such as caves, sinkholes, surface depressions, enlarged joints and fractures, and internal drainage, all of which may restrict or preclude development of the land. Karst terrain is common on the Colorado Plateau of northern Arizona, caused by the dissolution of salt in the Supai Formation. Numerous karst features exist along and nearby the Holbrook anticline in the southern margins of the Project area. Karst features in the area include sinkholes, depressions, large ground cracks with rotating blocks of rock, enlarged joints and fractures, and internally drained basins, such as

Dry Lake Valley, located just southwest of the Project area. Zones of very large ground cracks exist along the Pink Cliffs. Field evidence indicates that some cracks are geologically very young and the process of crack formation is still active (Harris 2002).

In addition to structural deformations and related hazards, dissolution of salt beds in karst topography has the potential to impact drinking water stored in underground aquifers. This can be through the introduction of dissolved salts or other containments – such as sewage, landfill leachate, or hazardous chemicals – which move freely through interconnected caverns and voids. The Coconino Sandstone is a major drinking water aquifer in the Project area. Wells along the north side of the Holbrook anticline produce water with salinity as high as 2,000 milligrams per liter (Harris 2002).

Investigation/Characterization

Geologic site conditions and hazards which possess potential for damage to structures and improvements, as discussed above (both reported and observed), would be addressed by geotechnical investigation of the Project area, including use of geophysics to characterize buried features. Based on the results of the investigations, appropriate strategies and approach to the proposed Project can be developed, including final locations of wind turbines and foundations types best suited to the site subsurface conditions.

3.2.1 Impacts of the Proposed Action

Potential impacts on the geology of the Project area include the following:

- accelerated erosion of the thin surface soils; and
- altered surface and subsurface drainage leading to accelerated groundwater quality impact.

The greatest potential of the above impacts to occur would be associated with construction of new access roads and upgrade of existing access roads, where the potential exists to impede or redirect surface water flow. To a lesser extent, construction of the O&M facility and substation also has the potential to impact surface flow and drainage. Subsurface excavations and disturbance associated with construction of the electrical collector system represent potential preferential pathways for seepage and transmission of surface flows to the subsurface. These potential impacts can be minimized through proper design and location of features associated with the Proposed Action and drainage control features and proper construction techniques.

Impacts on geological resources from construction and operation of the Proposed Action would not be significant. It is anticipated that impacts on the geologic resources of the area from the new unpaved access roads, upgraded existing access roads, and underground portions of the electrical collector system could result in minor accelerated erosion of surface soils and/or minor changes to drainage patterns. However, compliance with the Arizona Pollutant Discharge

Elimination System (AZPDES) and implementation of the Stormwater Pollution Prevention Plan (SWPPP) would minimize the potential for erosion associated with the Proposed Action.

3.2.2 Impacts of the No Action Alternative

No impacts on the geologic resources would occur under the No Action Alternative.

3.2.3 Mitigation Measures for Geological Resources

As described above, erosion control practices would be utilized in areas impacted by proposed construction per requirements of AZPDES permitting and the SWPPP developed for the Project.

3.3 PALEONTOLOGY

The BLM developed a Condition classification system for assessing the paleontological significance of geographic areas according to the probability of occurrence and the level of importance of fossils (BLM 1998):

- Condition 1 – Areas that are known to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Consideration of paleontological resources will be necessary if the Field Office review of available information indicates that such fossils are present in the area.

- Condition 2 – Areas with exposures of geological units or settings that have high potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The presence of geologic units from which such fossils have been recovered elsewhere may require further assessment of these same units where they are exposed in the area of consideration.

- Condition 3 – Areas that are very unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils based on their surficial geology, igneous or metamorphic rocks, extremely young alluvium, colluvium, or aeolian deposits or the presence of deep soils. However, if possible it should be noted at what depth bedrock may be expected in order to determine if fossiliferous deposits may be uncovered during surface disturbing activities.

As described in Section 3.2, the exposed geologic units in the Project area are the Moenkopi Formation with minor exposures of the Coconino Sandstone. Of the two units, only the Moenkopi Formation is known to contain significant vertebrate fossils in the area, but Nesbitt (2005) noted that these occur in just a few pockets, mostly north of U.S. Interstate 40; none of these are in or adjacent to the Project area. The Project area is therefore classified as Condition 3 – there are no known occurrences of significant fossil deposits in the area.

3.3.1 Impacts of the Proposed Action

The BLM does not anticipate the Proposed Action would impact paleontological resources.

3.3.2 Impacts of the No Action Alternative

The No Action Alternative would not impact paleontological resources.

3.3.3 Mitigation Measures for Paleontological Impacts

The BLM does not anticipate the Proposed Action would impact paleontological resources. Nevertheless, IBR would educate all construction workers in the identification of fossiliferous deposits and the consequences of unauthorized collection of fossils on public lands. In the event that significant paleontological resources are uncovered during surface disturbing activities, construction workers would be directed to halt construction and IBR would confer with the BLM regarding the need to avoid adversely impacting the fossils, removing the fossils, and/or monitoring ongoing construction activities. As appropriate, IBR would implement measures to prevent potential looting/vandalism or erosion impacts of any fossils uncovered during construction activities.

3.4 SOILS

According to the Natural Resource Conservation Service (NRCS) Web Soil Survey (NRCS 2007), the majority of surficial rock at the Project area is covered by a relatively thin soil layer from zero to 50 centimeters thick (zero to 20 inches). The majority of the site soils are indicated as being poor relative to construction use due to shallow depth, shrink-swell characteristics, and/or low strength (NRCS 2007). Soils in the Project area consist primarily of well-drained sandy loam, loam, and rocky outcrops. Slopes range from nearly flat to up to 30 percent (NRCS 1999). Soils are generally moderately to highly susceptible to water or wind erosion throughout the Project area, due to the lack of thick vegetative cover and dry conditions (see Figure 3-3). Over the past 100 years, soil resources in the region have been used for grazing purposes. This would remain the primary use of soils for the reasonably foreseeable future.

Problem Soils

Expansive soils – soils which expand or swell when wetted – typically contain a high fraction of clay minerals of the smectite family, including bentonite and montmorillonite. Expansive clays act like a sponge, absorbing large amounts of water and increasing in volume. Expansion of clay soils can cause walls and foundations to heave and crack and roads and sidewalks to warp in a manner similar to frost heaving. Expansive soils are common and widespread in Arizona. Low strength soils can compress and lose volume when loaded. This can lead to excessive settlement or differential settlement and associated structural damage, including cracking walls, foundations, roads, and sidewalks. According to the NRCS Web Soil Survey, certain soils at the Project area are indicated as poor for use in construction due to their shrink-swell potential or low strength.

3.4.1 Impacts of the Proposed Action

Construction of the wind turbines, access roads, electrical collection lines, and other Proposed Action facilities would increase the potential for soil erosion during construction. Soil disturbance would result from site clearing, excavation activities, and access road construction/grading.

About 185 acres of soil would be temporarily disturbed by construction of Phase I of the Project. Of this, about 32 acres would be permanently impacted by installation of Project facilities. Approximately 15 percent of the soils within the Project area are highly erodible, 12 percent are potentially highly erodible, and 73 percent are moderately erodible (not highly erodible). However, given the current layout of Phase I of the Project, areas of highly erodible lands would generally not be impacted (e.g., less than 10 percent of the access roads and collector lines would cross highly erodible soils). As such, a majority of the facilities associated with Phase I of the Project would be located on lands that are not highly erodible.

About 784 to 1,442 acres of soil would be temporarily disturbed by construction of the subsequent phases of the Project. Of this, about 113 to 217 acres would be permanently impacted by installation of Project facilities. Within the Project area for subsequent phases of the Proposed Action, approximately 47 percent of the soils are highly erodible, 13 percent are potentially highly erodible, and 40 percent are moderately erodible (not highly erodible). As such, a majority of the facilities associated with subsequent phases of the Project would be located on highly erodible soils.

3.4.2 Impacts of the No Action Alternative

No facilities would be built under this scenario, and no impacts on soils would occur.

3.4.3 Mitigation Measures for Soils Impacts

The Project area is located in an arid and relatively sparsely vegetated landscape. As such, much of the area contains soils that are naturally erodible. Nevertheless, steps would be taken to minimize contributing to additional soil impacts and/or erosion. For example, soil impacts would be minimized through compliance with the AZPDES permit conditions and implementation of a SWPPP. BMPs implemented during construction would include covering bare soils with mulch, plastic sheeting, or fiber rolls to protect washes and drainages from excessive sediment runoff, especially during significant precipitation events. Revegetation would also occur after construction is completed (Appendix D). Therefore, a measurable contribution to air or water degradation would not occur as a result of the Proposed Action, nor would a decline in range or habitat productivity.

3.5 WASTES (HAZARDOUS OR SOLID)

In May 2007, HDR Engineering completed a Phase I Environmental Site Assessment (ESA) to identify potential hazardous or solid waste sites in the Project area in general conformance with the American Society for Testing and Materials (ASTM) E 1527-05 guidance. The scope of the ESA included a review of regulatory Hazardous Materials (HAZMAT) databases, a review of

historic source information, interviews with persons familiar with the area, and an aerial reconnaissance by two qualified assessors (as defined by U.S. Environmental Protection Agency). The results of the ESA suggest that there are no existing or historic hazardous waste sites in or near the Project area.

3.5.1 Impacts of the Proposed Action

Based on the ESA and the specifics of the information gathered, the study team concluded that no constraints exist on the site regarding hazardous waste disposal issues. However, construction, operation, and decommissioning activities associated with the Proposed Action would require the use of some hazardous materials, although the variety and amounts of hazardous materials present during operation would be minimal. Types of hazardous materials to be used include fuels (e.g., gasoline, diesel fuel), lubricants, cleaning solvents, paints, and explosives. If appropriate management practices are implemented, the impacts associated with hazardous materials and wastes are expected to be negligible to nonexistent.

3.5.2 Impacts of the No Action Alternative

Without construction and operation of the Proposed Action, there are no other anticipated activities associated with hazardous materials or wastes in the Project area.

3.5.3 Mitigation Measures for Wastes (Hazardous or Solid) Impacts

IBR developed a hazardous materials management plan addressing storage, use, transportation, and disposal of each hazardous material anticipated to be used at the site. The plan identifies all hazardous materials that would be used, stored, or transported at the site. IBR submitted the hazardous materials management plan to the BLM as part of its Plan of Development. The plan establishes:

- inspection procedures;
- storage requirements;
- storage quantity limits;
- inventory control;
- nonhazardous product substitutes;
- disposition of excess materials; and
- material safety data sheets of hazardous materials.

The hazardous materials management plan identifies requirements for notices to federal and local emergency response authorities and include emergency response plans.

IBR developed a waste management plan that identifies waste streams and addressing hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. This plan

addresses all solid and liquid wastes that could be generated at the site. IBR included the waste management plan in its Plan of Development, which was submitted to the BLM.

Finally, IBR would develop a SPCC Plan prior to construction that identifies where hazardous materials and wastes are stored on site, spill prevention measures to be implemented, training requirements, appropriate spill response actions for each material or waste, the locations of spill response kits on site, a procedure for ensuring that the spill response kits are adequately stocked at all times, and procedures for making timely notifications to authorities.

3.6 WATER QUALITY AND QUANITY (SURFACE, GROUND, DRINKING)

Ground Water

Groundwater for the Project area is obtained from the Coconino-DeChelly Aquifer of Triassic and Permian bedrock units. This covers most of the Colorado Plateau region; large portions of Arizona, New Mexico, and Utah are underline by the Coconino-DeChelly Aquifer. Although concentrations vary by region, water from this aquifer tends to have high dissolved mineral concentrations. Water supply wells in the region access groundwater resources on the order of 300 to 600 feet below the ground surface (ADWR 2006). Groundwater resources may be encountered during excavations for wind farm facilities in low-lying and/or wet areas, but would likely represent perched water, not groundwater connected to the primary aquifer underlying the site.

Surface Water

The Project is located within the Upper Little Colorado River, Middle Little Colorado River, and Silver Creek watersheds of the Little Colorado River Basin (USGS 2007). There are no perennial water bodies in areas directly or indirectly disturbed by Project construction. In general, surface water in the Project area flows into several intermittent washes and tributaries (Sevenmile Draw, Tenmile Draw, Washboard Wash, East Washboard Wash, Louis Hunt Draw, Porter Tank Draw, and tributaries to Potter Canyon Draw) that flow north and east towards the Silver Creek and the Little Colorado River.

3.6.1 Impacts of the Proposed Action

Ground Water

Water needed for Project dust control, the concrete batch plant, cleaning concrete mix trucks, or other construction activities would be obtained from an existing onsite well in cooperation with a participating landowner. IBR estimates that between 8,000 and 20,000 gallons of water would be needed for construction of each turbine. This includes about 8,000 to 9,000 gallons of water for cement used in foundation construction and 11,000 to 12,000 gallons of water for dust control and other construction uses. As such, Phase I of the Project would require up to 860,000 gallons (2.6 acre-feet)Based on the recharge rate for this aquifer, there would not be any impact to the groundwater available. The participating landowner reports that the existing onsite well that

could be used for the Project produces 70 gallons per minute (100,800 gallons per day or 113 acre-feet-year).

Excavation for the turbine foundations or trenching for the electrical collector lines is not expected to require dewatering. If dewatering is found to be necessary during construction, groundwater would be properly stored and sediments would be settled out and removed before the water is discharged. Any impacts on the water table from dewatering would be temporary (limited to the construction period) and localized.

As the concrete mix trucks are unloaded, they would be washed out at the excavations for each tower foundation. Water from the washout would filter into the ground and/or evaporate. Given the depth to groundwater, washout activities are not expected to impact ground water quality.

No water storage, reprocessing, or cooling is required for either the construction or operation of the turbines, collector system, or substations. The O&M facility would have a permitted septic system and well to provide water. The septic system would be a leach field design, typical to the region. The well would be approximately 600 feet deep and provide less than 1,000 gallons of water per day. Water usage during the operating period would be similar to household volumes of less then five gallons per minute.

The Proposed Action would not have noticeable impact on either municipal or private water uses in the Project area, and would not result in violations of groundwater or drinking water quality standards.

Surface Water

Construction of the wind turbines, collector lines, substation sites, and access roads would disturb land within the Project area. The wind turbines would be built on uplands, thus avoiding washes located in the lower positions in the landscape. Substations, access roads, and electrical collection lines would also be designed to minimize impacts on the surface water features (see Section 2.1.2).

Construction, operation, and decommissioning activities for the Proposed Action are not expected to have an adverse impact on surface water quality. Construction of the facilities associated with the Proposed Action could potentially result in indirect impacts on surface water from increased runoff and sedimentation from disturbed areas. Likewise, the small increase in impermeable surfaces that would result from the Proposed Action could lead to increased runoff. However, the majority of the substation areas would remain as permeable surfaces, the relatively small amounts of impermeable surfaces from turbine foundations and outbuildings would be spread out over a large area, and erosion potential is not expected to be noticeably higher than under the existing land use at the sites. Direct impacts could occur from access road or collector lines crossing the streams in the Project area, although these impacts would be minimized by

constructing proper water diversion structures and by staying off of the roads when they are wet to avoid excessive rutting.

There is an unnamed wash that could be crossed by both an access road and collector line as part of the Phase I construction. Impacts from the access road would be minimal because the crossing would be completed when conditions are dry and any temporary surface water flow would not be interrupted through the use of an appropriately sized culvert.

Design of subsequent phases would avoid crossing streams whenever feasible. When a crossing is unavoidable, similar impacts as described for Phase I would be expected.

3.6.2 Impacts of the No Action Alternative

No facilities would be built under this scenario and no impacts on water resources would result.

3.6.3 Mitigation Measures for Water Quality and Quantity Impacts

Sound water and soil conservation practices would be maintained during construction, operation, and decommissioning of the Proposed Action to protect topsoil and adjacent water resources and minimize soil erosion. Prior to construction, IBR would apply for any necessary permits for impacts on waters of the U.S. that might be required by the U.S. Army Corps of Engineers. Phase I of the Project will not cross any waters of the U.S. so permits from the U.S. Army Corps of Engineers are not necessary. Access roads constructed adjacent to streams and drainageways would be designed in a manner so runoff from the upper portions of the watershed can flow unrestricted to the lower portion of the watershed. An AZPDES permit would be obtained and a SWPPP has been prepared prior to the construction of the Proposed Action. Additionally, an SPCC Plan that would be developed for the Proposed Action would be designed to minimize impacts on water quality from waste spills.

When construction requires movement of earth during wind conditions, water or chemicals would be used for dust suppression. Chemicals used for dust abatement would be minimal, but may be necessary in limited situations. The chemicals used would be from naturally occurring substances such as magnesium chloride, selected for its effectiveness in controlling fugitive dust, as well as minimizing potential environmental impacts. Prior to the use of any chemicals for dust abatement, IBR would confer with BLM's Authorized Officer to obtain approval.

3.7 WETLANDS AND RIPARIAN ZONES

The Project area for wetlands and riparian zones includes the Proposed Action boundary and surrounding lands that may be affected by temporary construction sites. Wetlands near the Project area were identified by reviewing National Wetland Inventory (NWI) maps and conducting a field visit. Although the NWI mapping shows several isolated basins (see Figure 3-4), a field verification of soils, vegetation, and hydrology concluded that there are no wetlands within Phase I of the Proposed Action (WEST 2007). Riparian zones in the Project area are referred to as xeroriparian zones – while typically quite dry, these zones might temporarily

maintain moderately moist soil and habitat conditions seasonally. There are several xeroriparian areas associated with washes in the Project area, including along Washboard Wash, Sevenmile Draw, Tenmile Draw, and a tributary to Potter Canyon Draw. Xeroriparian zones in the Project area are generally vegetated with pinyon pine and juniper shrubs. Xeroriparian zones in the Project area occur in the floodplains that are shown on Figures 3-4 and 3-5.

3.7.1 Impacts of the Proposed Action

Because there are no wetlands in the Project area, no impacts would occur as a result of the Proposed Action. Wind turbines would be built on uplands, avoiding xeroriparian zones, which are located in lower positions in the landscape. Substations, access roads, and electrical collection lines would also be designed to minimize impacts on xeroriparian zones.

Construction, operation, and maintenance activities for the Proposed Action are not expected to have an adverse impact on xeroriparian zones. Construction of the facilities associated with the Proposed Action could result in indirect impacts on xeroriparian zones from increased runoff or sedimentation from disturbed areas. Likewise, the small increase in impermeable surfaces that would result from the Proposed Action could lead to increased runoff into the xeroriparian zones. However, the majority of the substation areas would remain as permeable surfaces, the relatively small amounts of impermeable surfaces from turbine foundations and outbuildings would be spread out over a large area, and erosion potential is not expected to be noticeably higher than under the existing land use at the sites. Sound water and soil conservation practices would be maintained during construction and operation of the Proposed Action to protect topsoil and adjacent water resources and minimize soil erosion. Direct impacts could occur from access road or collector lines crossing xeroriparian zones, resulting in vegetation clearing.

The xeroriparian zone associated with the unnamed wash in the west ½ of Section 26, Township 15N, Range 19 E could be crossed by both an access road and collector lines as part of the Phase I construction (see Figure 2-2). Impacts from the access road would be minimal because the crossing is through a xeroriparian zone that is only sparsely vegetated with pinyon pine and juniper shrubs. Construction of an access road and collector cable through this zone would impact less than 1 acre of xeroriparian vegetation.

Design of subsequent phases would avoid crossing the xeroriparian zones associated with Sevenmile Draw and Tenmile Draw whenever feasible. If a crossing is unavoidable, similar impacts as described for Phase I would be expected.

3.7.2 Impacts of the No Action Alternative

No facilities would be built under this scenario and no impacts on wetlands or xeroriparian zones would result.

3.7.3 Mitigation Measures for Wetland and Riparian Zone Impacts

Sound water and soil conservation practices would be maintained during construction and operation of the Proposed Action to protect topsoil and adjacent water resources and minimize soil erosion. Major disturbance of xeroriparian zones and drainage systems would be avoided during construction. This would be done by designing the facility to avoid crossing xeroriparian zones with access roads and collector systems whenever possible. When it is not possible to avoid crossing a xeroriparian zone, mitigation strategies during construction would include:

- utilizing existing crossings;
- utilizing BMPs to avoid and minimize soil erosion; and
- revegetating temporarily disturbed xeroriparian zones.

For example, an access road siting and management plan was prepared, incorporating existing BLM standards regarding road design, construction, and maintenance such as those described in the Wind Energy PEIS and ROD (BLM 2005), BLM 9113 Manual (BLM and USFS 1985) and the Surface Operating Standards for Oil and Gas Exploration and Development (Fourth Edition 2006) (i.e., the Gold Book).

3.8 FLOODPLAINS

The Project area is located within the Upper Little Colorado River, Middle Little Colorado River, and Silver Creek watersheds of the Little Colorado River Basin (USGS 2007). The majority of the area is relatively flat with a slight slope to the north-northeast. As such, inundation from flooding is not expected to pose a hazard to the Proposed Action as a whole. However, inundation from flooding could occur in localized natural low spots or man-made depressions. The Project area is also traversed by numerous small drainages or washes, including Washboard Wash in the Phase I portion of the Project area. Flash-flooding is common in the desert southwest, especially during short-duration, high-intensity thunderstorms during the summer monsoon season. The Project area is characterized by thin soil cover and sparse vegetation with some areas of exposed bedrock, and flash-flooding along existing drainages should be expected.

There are six FEMA-mapped 100-year floodplains associated with tributaries (Sevenmile Draw, Tenmile Draw, Washboard Wash, East Washboard Wash, Louis Hunt Draw, and Porter Tank Draw) within the Project area, and one associated with an isolated basin south of the Pink Cliffs (FEMA 1998; Figure 3-4).

3.8.1 Impacts of the Proposed Action

Construction of the facilities associated with the Proposed Action is not expected to alter existing floodplain elevations, due to the placement of turbines, which would avoid any mapped floodplains. Access roads would also be designed to minimize impacts to floodplains whenever feasible. Phase I of the Project would avoid crossings or disturbances to any mapped floodplains. However, the linear nature of floodplains suggests that mapped floodplains associated with East

Washboard Wash, Louis Hunt Tank Draw, Tenmile Draw, and Sevenmile Draw could be crossed by access roads during construction of the subsequent phases portion of the Project.

Several of the FEMA floodplains would also be crossed by the collector system constructed during the subsequent phases of the Project. It is possible that several poles may be placed in floodplains if directional boring is not feasible, and overhead design is necessary and unable to span the entire floodplain. However, the small cross section of the distribution line poles is not expected to alter flood elevations.

Although construction of the proposed turbines, substations, and O&M facilities would involve a small increase in impermeable surfaces (from the control houses and structure footings), the change to local surface drainage patterns due to this and any necessary grading would be spaced out over a very large area and is expected to be negligible. The Proposed Action would not cause an increase in susceptibility of flooding in the region, thus avoiding significant impacts on floodplains.

3.8.2 Impacts of the No Action Alternative

No facilities would be built under this scenario and no impacts on floodplains would result.

3.8.3 Mitigation Measures for Floodplain Impacts

In general, the Proposed Action would avoid construction in FEMA-mapped floodplains. Phase I of the Project would avoid all mapped floodplains. Subsequent phases of construction would utilize mitigation techniques, such as avoidance of construction in floodplains whenever feasible, and proper design of culverts if access road crossings are unavoidable. If avoidance is not feasible, impacts from the access road crossings of the floodplains could be minimized by using an existing crossing. If widening of an existing access road is necessary, culverts would be sized appropriately so as to not restrict flood flows.

If appropriate, rolling dips or water bars would also be constructed to divert water and sediment off of access roads before it can reach the floodplain. Additionally, wind turbines, the interconnect substation, and O&M facilities as well as all associated work spaces associated with the subsequent phases would be set back at least 50 feet from small ephemeral water bodies, and 75 feet from medium ephemeral or intermittent water bodies.

3.9 VEGETATION

The Project area is located within the Colorado Plateau Semi-Desert Province Ecoregion in the north eastern quarter of Arizona (Bailey 1976). Within the Great Basin Desertscrub climatic zone, the Project area is part of a “cold desert” exhibiting harsh winters, low precipitation (scattered throughout the year), and extremes in both daily and seasonal temperatures (Brown 1994). Field surveys of natural communities in the Project area were conducted in April 2006 and May 2007. Overall, the Project area is comprised of desert scrub and grassland with a high

percent of bare ground (10 to 50 percent vegetative cover). Figure 3-5 illustrates the vegetation communities occurring in the Project area.

The surveys showed that the Project area is dominated by desert scrub and short /mixed grass grassland that is grazed by cattle. This community consists of open stands of bunchgrasses and scattered low shrubs and tall grasses, including the following species: blue grama (*Bouteloua gracilis*), galleta (*Hilaria sp.*), muhly (*Muhlenbergia sp.*), threeawn (*Aristida sp.*) needleandthread (*Stipa comata*), alkali sacaton (*Sporobolus airoides*), broom snakeweed (*Gutierrezia sarothrae*), rabbitbrush (*Chriysothamnus sp.*), saltbush (*Atriplex spp.*), and Mormon tea (*Ephedra sp.*) (WEST 2007). The field survey also found several populations of paper-spined cactus (*Pediocactus papyracanthus*), a federal species of concern and a state salvage-restricted species, within the desert scrub communities. Rare plant species are discussed in more detail in Section 3.12.

Pinyon/juniper woodlands were also present along Washboard Wash and near the Pink Cliffs of Phase I of the Project area, and along Sevenmile Draw, Tenmile Draw, and Tenmile Cedars along the eastern portion of the subsequent phases of the Project area. Species in this open-canopy community include oneseed juniper (*Juniperus osteosperma*), pinyon pine (*Pinus edulis*), dropseed (*Sporobolus sp.*), needle grass (*Stipa sp.*), buckwheat (*Eriogonum sp.*), prickly pear (*Opuntia sp.*), and cymopterus (*Cymopterus sp.*) as well as other species found in the desert scrub community (WEST 2007).

3.9.1 Impacts of the Proposed Action

Clearing, grading, and construction would result in the permanent and temporary loss of vegetation. Permanent vegetation loss would result from removal of vegetation at the following sites: turbines, support buildings, and access roads. Temporary disturbance would result from construction work zones and/or staging areas (including the temporary batch plant). Permanent loss of vegetation would be minimized by limiting the area of physical ground disturbance and be reseeding all disturbed areas with native grasses upon completion of construction activities.

About 185 acres of vegetation would be temporarily disturbed by construction of Phase I of the Project. Of this, about 32 acres would be permanently impacted by installation of Project facilities. About 87 percent of the vegetation temporarily and permanently impacted by construction in the Phase I portion of the Project would be desert grassland. The remaining impacts would be associated with pinyon/juniper woodlands.

About 784 to 1,442 acres of vegetation would be temporarily disturbed by construction of the subsequent phases of the Project. Of this, about 113 to 217 acres would be permanently impacted by installation of Project facilities. A specific facility layout of the subsequent phases is not yet available. Because over 90 percent of the subsequent phases portion of the Project area is desert grassland, it is likely that a majority of temporary and permanent impacts would be limited to this vegetation community.

Fugitive dust would be generated during clearing, grading, and vehicle travel. However, fugitive dust generation would be short-term and localized to the immediate area of construction. Control measures would be implemented to minimize fugitive dust emissions from construction-related traffic and ground disturbance. Vegetation could also be exposed to contaminants as a result of accidental spills of fuels and other hazardous materials during construction. The impacts would be localized to the spill location. A SPCC Plan would be prepared to minimize the potential for spills and to develop a protocol for cleaning up any accidental spills.

3.9.2 Impacts of the No Action Alternative

No facilities would be built under this scenario, and no impacts on vegetation would occur.

3.9.3 Mitigation Measures for Vegetation Impacts

The following measures would be used to avoid and minimize potential impacts on the vegetation of the Project area during selection of the final turbine sites, construction, and operation of all phases of the Proposed Action:

- minimize the need to clear existing trees and shrubs;
- use BMPs during construction and operation of the Proposed Action to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, and stabilizing restored material; and
- implementation of the Habitat Restoration Plan and Noxious Weeds and Invasive Species Control Plan (Weed Control Plan). This plan includes the use of seeding to establish permanent, perennial vegetative cover on disturbed areas to prevent erosion, reduce sediment and the volume of runoff, and improve water quality. Only native seed species would be used, emphasizing native bunchgrass species. The high desert grass seed mix used for restoration of the Project would likely include blue grama (*Bouteloua gracilis*), galetta (*Hilaria* sp.), three awn (*Aristida* sp.), needle and thread (*Stipa comata*), and alkali sacaton (*Sporobolus airoides*). A copy of the Weed Control Plan is included in Appendix D.

3.10 INVASIVE AND NONNATIVE SPECIES

The state of Arizona has laws addressing the control and eradication of noxious weeds and identifying specific species that fall under noxious weed definitions (A.A.C. R3-4-244 and -245). Table 3.10-1 summarizes the prohibited, restricted and regulated plants for the State of Arizona.

Table 3.10-1
Prohibited or Noxious Plants in Arizona

Prohibited, Regulated and Restricted Plants in Arizona
Prohibited Plants – prevented from entry into the state
Acroptilon repens (L.) DC. -- Russian knapweed
Aegilops cylindrica Host. -- Jointed goatgrass
Alhagi pseudalhagi (Bieb.) Desv. -- Camelthorn
Alternanthera philoxeroides (Mart.) Griseb. -- Alligator weed
Cardaria pubescens (C.A. Mey) Jarmolenko -- Hairy whitetop
Cardaria chalepensis (L.) Hand-Muzz -- Lens podded hoary cress
Cardaria draba (L.) Desv. -- Globed-podded hoary cress (Whitetop)
Carduus acanthoides L. -- Plumeless thistle
Cenchrus echinatus L. -- Southern sandbur
Cenchrus incertus M.A. Curtis -- Field sandbur
Centaurea calcitrapa L. -- Purple starthistle
Centaurea iberica Trev. ex Spreng. -- Iberian starthistle
Centaurea squarrosa Willd. -- Squarrose knapweed
Centaurea sulphurea L. -- Sicilian starthistle
Centaurea solstitialis L. -- Yellow starthistle (St. Barnaby's thistle)
Centaurea diffusa L. -- Diffuse knapweed
Centaurea maculosa L. -- Spotted knapweed
Chondrilla juncea L. -- Rush skeletonweed
Cirsium arvense L. Scop. -- Canada thistle
Convolvulus arvensis L. -- Field bindweed
Coronopus squamatus (Forskal) Ascherson -- Creeping wartcress (Coronopus)
Cucumis melo L. var. Dudaim Naudin -- Dudaim melon (Queen Anne's melon)
Cuscuta spp. -- Dodder
Drymaria arenarioides H.B.K. -- Alfombrilla (Lightningweed)
Eichhornia crassipes (Mart.) Solms -- Floating water hyacinth
Eichhornia azurea (SW) Kunth. -- Anchored water hyacinth
Elytrigia repens (L.) Nevski -- Quackgrass
Euphorbia esula L. -- Leafy spurge
Halogeton glomeratus (M. Bieb.) C.A. Mey -- Halogeton
Helianthus ciliaris DC. -- Texas blueweed
Hydrilla verticillata Royale -- Hydrilla (Florida-elodea)
Ipomoea spp. -- Morning glory [All species except *Ipomoea carnea*, Mexican bush morning glory; *Ipomoea triloba*, three-lobed morning glory (which is considered a restricted pest); and *Ipomoea aborescens*, morning glory tree]
Ipomoea triloba L. -- Three-lobed morning glory
Isatis tinctoria L. -- Dyers woad
Linaria genistifolia var. dalmatica -- Dalmation toadflax
Lythrum salicaria L. -- Purple loosestrife
Medicago polymorpha L. -- Burclover

Prohibited, Regulated and Restricted Plants in Arizona
Nassella trichotoma(Nees.) Hack. -- Serrated tussock *Onopordum acanthium* L. -- Scotch thistle *Orobanche ramosa* L. -- Branched broomrape *Panicum repens* L. -- Torpedo grass *Peganum harmala* L. -- African rue (Syrian rue) *Pennisetum ciliare* (L.) Link -- buffelgrass *Portulaca oleracea* L. -- Common purslane *Rorippa austriaca* (Crantz.) Bess. -- Austrian fieldcress *Salvinia molesta* -- Giant salvina *Senecio jacobaea* L. -- Tansy ragwort *Solanum carolinense* L. -- Carolina horsenettle *Sonchus arvensis* L. -- Perennial sowthistle *Solanum viarum Dunal* -- Tropical Soda Apple *Stipa brachychaeta Godr*. -- Puna grass *Striga* spp. -- Witchweed *Trapa natans* L. -- Water-chestnut *Tribulus terrestris* L. -- Puncturevine
Regulated - if found within the state, may be controlled or quarantined to prevent further infestation or contamination *Cenchrus echinatus* L. -- Southern sandbur *Cenchrus incertus M.A. Curtis* -- Field sandbur *Convolvulus arvensis* L. -- Field bindweed *Eichhornia crassipes (Mart.) Solms* -- Floating water hyacinth *Medicago polymorpha* L. -- Burclover *Pennisetum ciliare (L.) Link* -- buffelgrass *Portulaca oleracea* L. -- Common purslane *Salvinia molesta* -- Giant Salvinia *Tribulus terrestris* L. -- Puncturevine
Restricted - if found within the state, shall be quarantined to prevent further infestation or contamination *Acroptilon repens* (L.) DC. -- Russian knapweed *Aegilops cylindrica Host*. -- Jointed goatgrass *Alhagi pseudalhagi Bieb.) Desv*. -- Camelthorn *Cardaria draba (L.) Desv*. -- Globed-podded hoary cress (Whitetop) *Centaurea diffusa* L. -- Diffuse knapweed *Centaurea maculosa* L. -- Spotted knapweed *Centaurea solstitialis* L. -- Yellow starthistle (St. Barnaby's thistle) *Cuscuta* spp. -- Dodder *Eichhornia crassipes (Mart.) Solms* -- Floating water hyacinth *Elytrigia repens (L.) Nevski* -- Quackgrass *Euryops sunbcarnosus subsp. vulgaris* -- Sweet resinbush *Halogeton glomeratus (M. Bieb.) C.A. Mey* -- Halogeton *Helianthus ciliaris DC*. -- Texas blueweed *Ipomoea triloba* L. -- Three-lobed morning glory *Linaria genistifolia var. dalmatica* -- Dalmation toadflax *Onopordum acanthium* L. -- Scotch thistle

Source: Arizona Administrative Code R3-4-244 and 245, amended 1999.

Although specific surveys of the Project area have not been completed, the ecological baseline survey did not identify significant presence of any invasive or nonnative plants in the Project area (WEST 2007).

3.10.1 Impacts of the Proposed Action

Potential impacts concerning invasive and nonnative vegetation are assumed to be similar for all phases of construction. Construction of the wind turbines, access roads, electrical collection lines, and other associated facilities could introduce noxious species to a pristine area if construction vehicles track contaminated soil from a contaminated area, or if contaminated soil is used in fill areas associated with the Project substations or O&M facility. However, a Weed Control Plan has been developed for the Proposed Action that is designed to prevent the spread of noxious species (see Appendix D). The plan addresses monitoring and educating personnel on weed identification, and methods for treating infestations. Use of certified weed-free mulching would be required. If trucks and construction equipment were to arrive from locations with known invasive vegetation problems, a controlled inspection and cleaning area would be established to visually inspect construction equipment arriving at the Project area and to remove and collect seeds that may adhere to tires and other equipment surfaces.

If pesticides were to be used on site, an integrated pest management plan would be developed to ensure that applications would be conducted within the framework of BLM and Department of the Interior policies and would entail the use of only approved pesticides. Pesticide use would be limited to nonpersistent, immobile pesticides and would be applied only in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. Prior to the use of any pesticides, IBR would confer with BLM's Authorized Officer to obtain approval.

3.10.2 Impacts of the No Action Alternative

No facilities would be built under this scenario, and no changes to the existing invasive and nonnative species in the Project area would occur.

3.10.3 Mitigation Measures Invasive and Nonnative Species Impacts

The BMPs outlined in the Weed Control Plan developed for the Proposed Action would be used to prevent the introduction of invasive or nonnative species into previously uncontaminated areas (see Appendix D). IBR would require that all construction contractors guarantee that all vehicles and equipment arriving in the Project area will be clean of plant debris.

3.11 FISH AND WILDLIFE

Data on fish and wildlife resources in the Project area were obtained from a variety of sources, including literature review, species recovery and management plans, technical reports, and peer-reviewed journal articles. Local wildlife biologists with the BLM and Arizona Game and Fish Department (AGFD) provided valuable information on species and habitats within the Project area. Field investigations and biological studies were conducted between September 2005 and June 2007 to evaluate the ecological conditions in the Project area (WEST 2007). A copy of this study is included in Appendix C. Wildlife species in the Project area are those associated with desert scrub/grassland and pinyon/juniper woodland habitats found within the Colorado Plateau Ecoregion (AGFD 2006). Included below is a discussion of birds, bats, other mammals, fish, and reptiles and amphibians.

Birds

Various migratory and resident bird species utilize the Project area during their life cycle. Migratory bird species are those that may use the Project area for resting, foraging, or breeding activities for only a portion of the year. Resident bird species occupy the proposed wind farm site throughout the year. Sixty-five avian species were observed during the surveys. A list of bird species observed in the Project area during the field surveys is presented in Appendix C. Passerines were the most numerous group and comprised over 95 percent of all birds observed. Passerine birds commonly observed in the survey include horned lark, common raven, mountain bluebird, and dark-eyed junco. Raptors comprised only 1 percent of birds observed. The most common raptor was red-tailed hawk. Other birds (shorebirds, doves, non-passerines) comprised about 3 percent of all birds observed.

The WEST (2007) study suggests that the Project area is not within a major migratory pathway, either for diurnal or nocturnal migrants. The Project area does not appear to provide important stopover habitat for migrant songbirds. Further, there were no seasonal increases in use by passerines and other typical nocturnal migrants than might be detected if the Project area was within a major migratory corridor.

The site vicinity is not a major waterfowl staging area or migration route, and passerines usually migrate at high altitudes through the area. The nearest area regularly used by waterfowl is likely Dry Lake, across State Highway 377 approximately 2 miles west of the Project area. WEST's avian survey recorded one group of unidentified shorebirds over a year of observation (WEST 2007).

Raptors observed in the Project area include red-tailed hawk, American kestrel, northern harrier, golden eagle, and bald eagle (WEST 2007). It is possible that other raptor species could occur in the Project area, particularly during the winter months or migration periods. Some of these species include: Swainson's hawks, ferruginous hawks, rough-legged hawks, merlins, prairie falcons, peregrine falcons, and great horned owls. Mean annual raptor/vulture use in the Project area is only 0.15 raptor per survey (WEST 2007). This is lower than raptor use at 27 of 28 wind resource areas (sites where other wind energy projects have been proposed and/or developed) where avian studies have been completed using similar protocols (WEST 2007). Although not located near any proposed turbines, there were four active raptor nests generally located in the Phase I Project area included those of golden eagle, red-tailed hawk, great horned owl, and barn owl.

Because they are protected under the Bald and Golden Eagle Protection Act, bald and golden eagles tend to be of particular interest. Three individual bald eagles (two adults and one sub-adult) were observed flying through the Phase I study area during the avian use surveys. All three observations were during the winter season (December – February). Seven golden eagles were observed during the point count surveys completed in the Phase I area (two in the Fall, two

in the Spring, and three in the Summer). These numbers equate to an overall composition of 4 and 10 percent of all raptor observations for bald and golden eagles, respectively. Generally, these numbers illustrate the relative infrequency these species were observed in the Project area – particularly when considering that general raptor use at the site is lower than at 27 of 28 wind resource areas where avian studies have been completed using similar protocols (WEST 2007). The conclusion that eagle use of the Project area is low is supported by data from the North American Breeding Bird Survey; neither bald or golden eagles were observed along the closest regularly surveyed route (i.e., the route from Clay Springs to a point on State Highway 377 just south of Dry Lake) during the June surveys (Sauer et al. 2007).

Bats

There are 17 species of bat that inhabit northeastern Arizona (WEST 2007). A bat use survey, using acoustical equipment, was conducted in the Project area from July through October 2006. Survey areas were concentrated around the Pink Cliffs area of Phase I of the Proposed Action, where features such as ground fissures, caves, and a stock pond could support bat populations (WEST 2007). The bat surveys recorded low bat activity in the Project area and did not find evidence of a hibernaculum on the site.

Other Mammals

In addition to bats, other mammals present within the Project area are typical of grazed desert scrub habitat and pinyon/juniper woodlands of the Colorado Plateau Ecoregion. Mammals occurring in these habitats include pronghorn antelope (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), elk (*Cervus elaphus*), blacktail jackrabbit (*Lepus californicus*), Colorado chipmunk (*Tamias quadrivittatus*), rock squirrel (*Spermophilus variegates*), white-footed mouse (*Peromyscus leucopus*), cottontail rabbits (*Sylvilagus sp.*), porcupine (*Erethizon dorsatum*), and gray fox (*Urocyon cinereoargenteus*).

The main game species of concern in the Project area is the pronghorn antelope, which has declining populations in Arizona. The species has been impacted by land use changes such as encroaching development, roadway construction and other fragmentation and land use changes of the landscape (AGFD 2007). There are several water tanks/holes located throughout the Project area that may be important to pronghorn[1] – particularly during the fawning season that typically peaks around May 22 at this elevation and latitude (Ticer, et al. 1996). However, grazing and general range conditions may not allow for quality habitat (typically 10-18 inches of vegetation cover) throughout much of the area.

Observations by WEST during the yearlong ecological baseline surveys suggest that pronghorn use the Project area throughout the year. Although a majority of the observations were during the

[1] During a field reconnaissance of the Phase I Project area in May 2008, several small metal cattle tanks and one AGFD wildlife watering tank held water that could be used by pronghorn (see Figure 3-6); all dirt tanks in the area were dry.

winter months (November – January), there was another smaller peak of observations during April (Young 2007).

Fish

There is very little aquatic habitat in the Project area. There are several small stock ponds scattered through the Project area, several dry washes and intermittent streams, only a few of which have aquatic/emergent vegetation. It is possible that some of the larger intermittent drainages (Washboard Wash, Tenmile Draw) support warm water species during the rainy season; however, they are not important fisheries. The other ephemeral streams in the Project area have little to no flow throughout the year and would not support fish populations.

Reptiles and Amphibians

There are up to 27 species of reptiles and amphibians that could occur in the Project area. These include the greater short-horned lizard (*Phrynosoma hernandesi*), longnosed leopard lizard (*Gambelia wislizenii*), common lesser earless lizard (*Holbrookia maculate*), eastern collared lizard (*Crotaphytus collaris*), Mexican spadefoot (*Spea multiplicata*), Sonoran night snake (*Hypsiglena torquata chlorophaea*), and striped whip snake (*Masticophis taeniatus*). There are no known critical breeding habitats or hibernaculae for any of these species within or in the vicinity of the Proposed Action.

3.11.1 Impacts of the Proposed Action

General impacts of construction and operation of wind energy impacts are summarized in the Wind Energy PEIS (BLM 2005). Potential impacts on wildlife species would be expected to be similar for all phases of the Proposed Action. Wildlife impacts associated with construction and operation of the Project includes:

- habitat disturbances associated with construction or operational activities and new facilities including the introduction of invasive vegetation, erosion and runoff, and fugitive dust;
- interference with behavior or migration from Project facilities, noise, and human activity; and
- injury or mortality associated with collisions with construction equipment and/or turbines, meteorological towers, and overhead transmission lines.

Wildlife that inhabit the Project area could be affected in the short-term within the immediate area of construction, and in the long-term by the presence of turbines and other Project facilities. Based on studies of existing wind power projects throughout the United States, Project impacts are primarily expected to be associated with birds and bats. Appendix C provides the results of the bird and bat use surveys conducted for the Dry Lake area and the following section provides a summary of the findings.

Birds

Direct impacts from construction activity, such as mortality from collisions with construction vehicles, is expected to be low and of short duration. Construction activity during nesting season could result in direct impacts on eggs or fledglings or indirect impacts if construction occurs adjacent to nests and results in disturbance of nesting individuals. The avian use study conducted for the Project area indicates that raptor nest density is relatively low in the Project area. Nesting bird studies at other wind projects in the United States have shown that the presence of turbines can result in lower densities of nesting birds in the immediate vicinity. It was hypothesized that lower avian use may be associated with avoidance of turbine noise, maintenance activities, and less available habitat. Because the Proposed Action is sited in a region where the habitat is relatively homogenous for extensive areas, it is unlikely that such small-scale displacement would result in population-level impacts.

Other indirect impacts could occur due to loss of habitat and temporary displacement from construction activities. The lattice work structure for the permanent meteorological tower may be an attractant for birds as a possible roost or nesting platform. However, a review of the history of these towers at other locations indicates this is not an issue. Some individual birds may be temporarily displaced during construction. However, disturbance would be limited to the duration of construction activities. Project phasing would allow individuals to move into undisturbed portions of the Project area or adjacent habitat during construction and return to the area upon completion of construction. Construction related disturbance from noise is not expected to result in reduced survival and reproductive success, and would result in only a temporary adverse impact on wildlife.

Once the Project begins operation, the greatest potential for wildlife impacts is associated with collisions with turbines, meteorological towers, and overhead transmission lines. Based on the avian use surveys conducted between the fall of 2005 and the summer of 2006 (supplemented with a reconnaissance-level field visit in May 2007), the Project does not appear to be located within a major migratory bird pathway (for either diurnal or nocturnal migrants) nor does it appear to provide important stopover habitat for migrants (WEST 2007). Using data collected from wind energy sites around the country, avian mortality at the Project area would likely be similar to the national average of 3.1 birds/MW/year (NWCC 2004). This would equate to a mortality rate of about 1,172 birds per year or 3.2 birds per day after the entire 378 MW have been installed. Species composition indicates that horned larks would likely make up the majority of bird fatalities (WEST 2007). An in depth review of avian mortalities associated with collisions with human structures suggests that about 0.01 to 0.02 percent are associated with wind turbines (Erickson et al. 2001). This equates to 1 to 2 out of every 10,000 bird deaths. Even if wind energy facilities were to become quite numerous, they would likely cause no more than a few percent of all collision deaths related to human structures (roads, powerlines, communication towers, buildings and windows).

Based on data collected at wind energy projects around the country, raptor fatalities associated with the Proposed Action could be about 0.04 raptors per MW per year, ranging from 0.00 and 0.09 raptors per MW per year (NWCC 2004). However, there appears to be a strong correlation between raptor use and raptor mortality. As such, the relatively low raptor use rate of the Project area suggests that actual mortalities associated with the Project would also be below the national average (WEST 2007). Assuming a fatality rate of 0.03 raptors per MW per year, raptor fatalities associated with the Proposed Project would be about 11 raptors per year once the entire 378 MW are constructed. These are far lower fatality rates than have been observed at some of the early wind energy project sites that were developed in California. At these sites, a high prey base for raptors, large populations of raptors, topography, the large size of the wind energy facilities, and potentially the older turbine designs, all contributed to relatively high raptor mortality levels (Erickson et al. 2001).

Assuming use is related to mortality and risk to raptors is equal across species and seasons, a majority of the raptors killed during operation of the Project would be red-tailed hawks and American kestrels. After the entire 378 MW are constructed, mortality of bald eagles would be about 0.45 eagles per year (based on estimates taken from NWCC 2004). This is likely a very conservative assumption for bald eagles, a species that would not be expected to forage in the vicinity of wind turbines. While bald eagles have been observed near wind energy projects, no bald eagle fatalities have been reported from wind projects that have been monitored (Erickson et al. 2001, WEST unpublished data).

Based on the assumptions used above, golden eagle mortality would be about 1.13 eagles per year after the entire 378 MW are constructed. This also may be somewhat high given there currently is little available foraging habitat in the Project area (e.g., prey species such as prairie dogs and ground squirrels are not abundant in the Project area). However, golden eagle typical habitat use, flight, and foraging behavior make it more susceptible to mortality than the bald eagle.

During operation of the Project, it is also possible for noise generated from the wind turbines, transmission lines, and truck and maintenance equipment to impact wildlife. A study of the effect of wind turbines on grassland birds was conducted in southwestern Minnesota (Leddy et al. 1999). In that study, higher bird population densities were reported from control areas and areas that were 591 feet away from turbines than in areas that were within 262 feet of the turbines. While the authors could not determine the specific cause of the observed effect, they suggest that noise, the presence of an access road, and the physical movement of the turbines could have produced the effect. As reported in the Wind Energy PEIS (BLM 2005), the results of various studies on the effects of noise on wildlife suggests that the densities of bird populations in the vicinity of wind energy project may be reduced near turbines, transmission lines, and other facility equipment if continuous noise levels are in the range of 40 dBA or higher. While the specific behavioral responses of birds in the Project area to turbines are unknown, there could be some displacement of passerines in the immediate vicinity of wind turbines. Because the

Proposed Action is sited in a region where the habitat is relatively homogenous for extensive areas, it is unlikely that small-scale displacement of birds would result in significant population-level impacts.

Bats

The most probable impact on bats resulting from the Proposed Action is direct mortality or injury due to collisions, either during migration or during movement of resident species. Direct impacts from construction activity, such as mortality from collisions with construction vehicles, is expected to be low and of short duration.

The bat use survey conducted in July to October 2006 determined that the Project area has lower bat activity than any of the other wind energy sites across the United States where similar studies have been conducted (WEST 2007). As stated above, the majority of the activity is in the Pink Cliffs area where fissures and caves provide suitable roost habitat. Additionally, pinyon/juniper communities can provide roosting habitat within the Project area. The survey did not indicate that the site is used as a significant residence or major migratory corridor (although data is missing for August, a peak activity month) and bat mortality is expected to be relatively low as a result of the Proposed Action. Bat mortality studies for wind projects with similar levels of bat activity in the Rocky Mountain region suggest that mortality rates for the Project would be about 1.9 bats per MW per year (NWCC 2004). This would equate to a mortality rate of about 718 bats per year or 2.0 bats per day after the entire 378 MW have been installed. Based on the site-specific bat use survey as well as other studies in the region, hoary bats, silver-haired bats, and Brazilian free-tailed bats would make up the majority of the bat mortalities (although woodlands, common habitats for the hoary and silver-hared bat, is limited in the Project area). *Myotis* species and big brown bats would likely make up smaller percentages of the bat mortalities (WEST 2007).

Other indirect impacts could occur due to loss of habitat and temporary displacement from construction activities. Individuals may be temporarily displaced during construction. Disturbance would be limited to the duration of construction activities. Project phasing would allow individuals to move into undisturbed portions of the Project area or adjacent habitat during construction and return to the area upon completion of construction.

Other Mammals

The Proposed Action is not expected to adversely impact any mammal populations, including the local pronghorn antelope population. However, some individuals of less mobile species (e.g., mice, gophers) may be injured or killed by construction equipment. Individuals of more mobile species (e.g., pronghorn, coyote) would be temporarily displaced from occupied habitats. Disturbance would be limited to the duration of construction activities. Project phasing would allow individuals to move into undisturbed portions of the Proposed Action or adjacent habitat during construction and return to the area upon completion of construction.

The Proposed Action would not contribute to a decline in the pronghorn antelope populations. There would be no long, linear fences installed as part of the Proposed Action that could interfere with pronghorn movements (only fencing around individual structures such as substations and O&M facilities). If high-impact construction activities (activities that involve blasting, grading, other major ground disturbance, and high levels of construction traffic) are scheduled to occur within 0.6 mile of functional watering facilities during the peak pronghorn fawning season (May 1 through June 30), IBR would confer with BLM and AGFD biologists regarding the potential for the Project to impact pronghorn and the need to develop appropriate mitigation. Mitigation measures could include implementing long-term range improvement projects in the area such as creating additional watering sites, enhancing existing watering sites, modifying existing on-site fencing (working with agencies and landowners to identify areas where "pronghorn friendly fencing" could be installed).

Fish

The Proposed Action is not expected to impact any fishery resources. Turbines, substations, the O&M facility, and collector lines would avoid direct impacts on streams and lakes. Access road crossings of intermittent streams would be designed to utilize existing crossings whenever feasible, and would be engineered so runoff from the upper portions of the watershed can flow unrestricted to the lower portion of the watershed, therefore avoiding impacts on fishery habitat. Indirect impacts would be avoided by using sound water and soil conservation practices during construction and operation of the Proposed Action to protect topsoil and minimize soil erosion.

Reptiles and Amphibians

The Proposed Action is not expected to adversely impact reptile or amphibian populations. However, individuals may be crushed by construction equipment and/or temporarily displaced from occupied habitats. Disturbance would be limited to the duration of construction activities. Project phasing would allow individuals to move into undisturbed portions of the Project area or adjacent habitat during construction and return to the area upon completion of construction.

3.11.2 Impacts of the No Action Alternative

No facilities would be built under this scenario. No impacts on wildlife species would result from new construction.

3.11.3 Mitigation Measures for Wildlife Impacts

On May 13, 2003, the USFWS developed its *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines*. It should be noted that these USFWS guidelines are voluntary, that the USFWS has issued correspondence emphasizing that the guidelines are voluntary and interim, and that the USFWS is initiating a process to revise the guidelines. IBR has been an active participant in this review and revision process and its Director of Wind Permitting (A. Linehan) has been nominated to be a member of the Federal Advisory Committee Act committee that will be assisting in the revising of the USFWS guidelines. The USFWS' Interim guidelines include the following major categories: studies to assess and monitor wildlife impacts, site

development recommendations, and turbine design and operation recommendations. Specific aspects of the USFWS' Interim guidelines and other measures that IBR would implement to avoid and minimize wildlife impacts associated with the Proposed Action include:

Studies to Assess and Monitor Wildlife Impacts

As noted previously and described in the report in Appendix C, WEST (2007) conducted an ecological baseline study to:

- provide information on avian and bat resources and use of the study area for evaluating the potential impacts and the relative risk of the proposed Project;
- provide information on avian and bat use of the study area to help in designing the Project in a manner that is less likely to expose species to potential collisions with turbines; and
- provide recommendations for further monitoring studies and potential mitigation measures, if appropriate.

While some information was gathered for the subsequent phases portion of the Project area, the focus of the initial ecological baseline report was the Phase I portion of the Project area. IBR proposes to conduct additional pre-construction surveys prior to siting turbines associated with each of the subsequent phases of the Project. These surveys would include:

- point count avian surveys during the spring, particular near the water ponds associated with the nearby pig farm operation;
- aerial surveys to identify raptor nests;
- aerial and ground surveys to identify occupied prairie dog colonies; and
- aerial and ground surveys for caves and/or ground fissures to identify potential bat roosting habitat within the Project boundary as well as other potential roost sites (e.g., bridges and culverts along State Highway 77) in the general vicinity of the Project. If potential bat roost sites are found in close proximity to turbine locations, bat mist-net and/or acoustic surveys studies would be completed to assess bat use and species presence.

These surveys would be designed to assess the risk of bird/bat collisions as well as measures that might be useful to avoid or minimize wildlife impacts. Each of these surveys would be completed the season prior to any scheduled construction by trained wildlife biologists.

Additionally, IBR would coordinate with the appropriate agency (e.g., BLM, USFWS, and AGFD) biologists regarding survey protocols prior to initiating any of these surveys.

After each phase of the Project begins operation, IBR would contract with experienced wildlife biologists to conduct a formal post-construction monitoring study designed to estimate avian and bat mortality for one year after the Project begins operations. If the project phases are not constructed concurrently, separate post-construction monitoring studies would be conducted for the first and second phase. If the results of the post construction fatality monitoring for these phases indicates that the number of bird fatalities is significantly different between the first two years or the number of fatalities is of biological concern, then post construction avian fatality monitoring of subsequent phases may be conducted. These post-construction monitoring studies would follow protocols generally described in the National Wind Coordinating Committee's *Studying Wind Energy/Bird Interactions: A Guidance Document* (NWCC 1999). A formal Bird and Bat Mortality Report will be prepared for each monitoring study, and would be provided to the BLM, USFWS and AGFD, and would be available to the public. Monitoring data include fatality data, data on incidental finds by fatality searchers and operational personnel, and an estimated avian and bat fatality rate expressed in number of avian and bat fatalities per MW per year. The monitoring report(s) prepared for the subsequent phases of the project would include an estimate of the number of avian and bat fatalities for the particular phase, as well as an estimate for the entire facility per year.

IBR would also train construction contractors and operational staff on protocols for responding to dead or injured wildlife and in assessing general habitat conditions (e.g., for noting potential increases in prairie dog or ground squirrel activity in the area). Injured or dead wildlife encountered during construction or operation would be reported to the Field Contact Representative during construction or the appropriate onsite manager during operations. Any carcasses discovered would be digitally photographed and recorded on a Wildlife Incident Reporting Form. If the carcass is found during formal avian and bat fatality monitoring, the carcass would be reported to the independent biologist conducting the monitoring so that the data can be included in the fatality monitoring data as an incidental find. If warranted and appropriate, injured wildlife would be transferred to a wildlife rehabilitation center for treatment. If the injured or dead animals are state or federal endangered, threatened or protected species, the incident would be immediately reported to the BLM, USFWS, and the AGFD. IBR would provide these agencies an annual report summarizing bird and bat fatalities recorded and general habitat conditions throughout the operational life of the Project. IBR will annually confer with the BLM regarding the results of ongoing biological monitoring for the first five years of Project operation.

Site Development Measures

For the Dry Lake Wind Project, IBR would:

- coordinate with the appropriate agencies (including the BLM, AGFD, and USFWS) prior to finalizing a facility layout;

- avoid placing turbines in documented locations of any species of wildlife, fish, or plant protected under the federal Endangered Species Act and the Bald and Golden Eagle Protection Act;

- avoid or minimize placing turbines in documented locations of any species of wildlife, fish, or plants listed as species of concern by the USFWS, BLM, or state of Arizona;

- avoid or minimize disturbance of individual xeroriparian or drainage systems during construction of the Proposed Action;

- protect existing trees and shrubs that are important to the wildlife present in the area;

- avoid placing turbines in known local bird migration pathways or in areas where birds protected under the Migratory Bird Treaty Act are highly concentrated;

- avoid placing turbines in known daily movement flyways (e.g., between roosting and feeding areas) and areas with a high incidence of fog, mist, low cloud ceilings, and low visibility;

- avoid placing turbines near known bat hibernation, breeding, and maternity/nursery colonies, in migration corridors, or in flight paths between colonies and feeding areas (e.g., turbines associated with Phase I of the Project are setback from the Pink Cliffs, an area where bat use is expected to be concentrated);

- configure turbine locations to avoid areas or features of the landscape known to attract raptors (hawks, falcons, eagles, owls). For example, golden eagles, hawks, and falcons use cliff/rim edges extensively; setbacks from these edges may reduce mortality. Other examples include not locating turbines in a dip or pass in a ridge, or in or near prairie dog colonies;

- avoid impacts on sensitive raptor species by limiting high-impact construction activities (activities that involve blasting, grading, other major ground disturbance, and high levels of construction traffic) to distances further than 1,300 feet from occupied raptor nest sites during the sensitive nesting season;

- remove any nests (after nesting season) and add nest deterrent devices to the lattice design meteorological tower(s) if nesting becomes an issue after installation;

- avoid impacts on pronghorn antelope by conferring with BLM and AGFD biologists if high-impact construction activities (activities that involve blasting, grading, other major ground disturbance, and high levels of construction traffic) are scheduled to occur within 0.6 mile from functioning watering sites during the fawning season (May 1 through June 30). If BLM and AGFD biologists indicate that pronghorn have the potential to be adversely impacted, then IBR would work with the BLM and AGFD to develop appropriate mitigation. Mitigation measures could include implementing long-term range improvement projects in the area such as creating additional watering sites, enhancing existing watering sites, or modifying existing on-site fencing (working with agencies and landowners to identify areas where "pronghorn friendly fencing" could be installed);

- minimize constructing new roads and maintaining current levels of public access;

- minimize constructing new fences and other infrastructure;

- develop a Habitat Restoration Plan for the proposed site that avoids or minimizes negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species (see Appendix D);

- remove and dispose of all carcasses of livestock, big game, and other wildlife found near turbines that might attract foraging raptors in a timely manner; and

- maintain sound water and soil conservation practices during construction and operation of the Proposed Action to protect topsoil and adjacent resources and to minimize soil erosion. To minimize erosion during and after construction, BMPs for erosion and sediment control would be utilized.

Turbine Design and Operation Measures

For the Dry Lake Wind Project, IBR would:

- use tubular turbine towers rather than lattice towers to minimize bird perching and nesting opportunities (a review of the history of these towers at other locations indicates this is not an issue);

- avoid placing external ladders and platforms on tubular towers to minimize perching and nesting;

- avoid use of guy wires for turbine or meteorological tower supports;

- minimize turbine and other facility lighting to reduce the potential for attracting night-migrating songbirds and similar species (while still meeting FAA requirements);

- install electric collector lines underground to the extent feasible. IBR will design all aboveground transmission line support structures following the practices suggested by the Avian Powerline Interaction Committee (APLIC 1996) and install anti-perching devices on transmission pole tops and cross arms where the poles are located within ½ mile of turbines; and

- establish and enforce reasonable driving speed limits within the Project to minimize potential for road killed wildlife or livestock that could attract foraging raptors.

3.12 THREATENED AND ENDANGERED SPECIES

Federal agencies are required by Section 7 of the Endangered Species Act to ensure that any actions authorized, funded, or carried out by the agency do not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modifications of the designated critical habitats of a federally listed species. The action agencies are required to consult with the USFWS to determine whether federally listed endangered or threatened species or designated critical habitat are found in the vicinity of the proposed project, and to determine the proposed action's potential effects on those species or critical habitats. For actions with the potential to affect listed species or designated critical habitat, the federal agency must prepare a Biological Assessment for those species that may be affected. The action agency must submit its Biological Assessment to the USFWS.

In compliance with Section 7 of the Endangered Species Act, the BLM submitted a Biological Assessment to the USFWS for the Dry Lake Wind Project on October 22, 2007. Included below is a summary of the Biological Assessment provided to the USFWS (a copy of this document is available for public review at the Safford Field Office). In a letter dated November 16, 2007, the USFWS concurred with the determinations of effect included in the BLM's Biological Assessment for the Project. Additionally, an assessment of other special status species is also included.

Threatened, endangered, and other special status species that have the potential to occur in the Project area were identified through correspondence with federal and state agencies. Federally listed threatened and endangered species and species that are listed by the USFWS, BLM, or state of Arizona as species of concern, were all evaluated as to the likelihood of occurring in the habitat within the Project area. Field surveys of the Project area further refined the analysis of the potential for rare species' occurrence. Table 3.12-1 lists the species that have the potential to occur in the Project area, describes suitable habitat and lists the likelihood of occurrence within the Project area. Appendix C describes the locations of special status species observed during WEST's 2006 and 2007 ecological field surveys.

Table 3.12-1
Special Status Species in Project Area

Species	Ranking	Habitat	Notes
Paper-spine Cactus (*Pediocactus papyracanthus*)	Federal Special Concern; State Salvage Restricted	Open flats in desert grasslands and pinyon/juniper woodlands	Species observed on Project area in desert scrub habitat.
Peebles Navajo Cactus (*Pediocactus peeblesianus var. peeblesianus*)	Federally Endangered; State Highly Safeguarded	Gravelly alluvium, on gently sloping hills to flat hilltops in desert scrub and grassland	Low likelihood of occurrence in Project area. Suitable substrate is absent.
Roundleaf Errazurizia (*Errazurizia rotundata*)	BLM-sensitive; State Salvage Restricted	Sandy soils, gravelly soils, or alluvial cinders on exposed sites in outcrops	Low likelihood of occurrence in Project area. Suitable substrate is absent.
Gunnison's Prairie Dog *(Cynomys gunnisoni)*	State Species of Greatest Conservation Need	Grasslands and shrubland	Prairie dogs observed on Project area
Little Colorado River Spinedace (*Lepidomeda vittata)*	Federally Threatened, State Species of Wildlife Concern		Known populations located in Silver Creek downstream of Project area

Paper-spine Cactus

The paper-spine cactus is a federal species of special concern, and a state salvage-restricted species. It is found in flat, open areas within both the desert scrub and pinyon/juniper habitats. The 2006 survey found nine subpopulations of the paper-spined cactus within the Phase I boundaries, and it is likely that other subpopulations exist throughout the Project area (WEST 2007).

Peebles Navajo Cactus

The Peebles Navajo cactus is a federally listed endangered species, and a state highly safeguarded species. It is found on gently sloping hills and flat hilltops in desert scrub habitats on a specific substrate of gravelly alluvium derived from Shinarump Member of the Chinle Formation. No known occurrences are near the Project area, and the field surveys did not observe the species. Due to the lack of the specific substrate needed for this species, it is unlikely that it is present at the Project area (WEST 2007).

Roundleaf Errazurizia

The roundleaf errazurizia is a state salvage-restricted species found in exposed outcrop sites. The species is generally limited to specific substrates: sandy soils in sandstone, gravelly soils in calcareous outcrops, and deep, alluvial cinders in sandstone breaks. No known occurrences are

near the Project area, and this species was not identified during field surveys. Due to the lack of the specific substrate needed for this species, it is unlikely that it is present at the Project area (WEST 2007).

Gunnison's Prairie Dog

Gunnison's prairie dogs are found on grasslands and montane shrublands at elevations from 6,000 to 12,000 feet (USFWS 2006). Populations of Gunnison's prairie dog colonies are variable, depending on habitat, the season, disease, and precipitation as well as human influences such as chemical control and recreational shooting. The 2006 survey observed three individuals within the Phase I boundaries, and it is likely that other prairie dogs may be found in the Project area (WEST 2007). IBR would conduct additional surveys to identify any potential prairie dog colonies in the eastern portion of the Project area prior to siting turbines associated with subsequent phases of the Project.

The USFWS was petitioned to list this species on the federal list of endangered or threatened species. In a 2006 decision, the USFWS determined that the agency would not conduct an in-depth analysis to consider listing Gunnison's prairie dog due to lack of sufficient evidence that such a review is warranted (USFWS 2006). However, public interest in the species' status remains high, and the AGFD lists the prairie dog as a species of greatest conservation need (AGFD 2006). Some of the reasons for the species decline are habitat loss, habitat fragmentation, and direct mortality from poisoning and recreational shooting.

Little Colorado River Spinedace

The spinedace is a federally threatened, state species of wildlife concern. It is a small (less than 4 inches), silvery fish that is generally found in slow to moderate flowing streams with gravelly bottoms, preferring unshaded pools and water depths of 2 feet. Populations fluctuate greatly from year to year with flood and drought cycles, but in general the species is declining due to reduced stream flow from habitat alteration as well as negative interaction with nonnative fish (AGFD 1994). Populations of the spinedace are known to occur in Silver Creek, just east and downstream of the Project area, and in the Little Colorado River, north of the Project area (BLM 2007). The Project area is not within any designated Critical Habitat for the species (USFWS 1987). The 1997 USFWS Little Colorado Spinedace Recovery Plan includes methods to conserve existing populations, including: maintaining and restoring the natural hydrology and habitat of streams and avoiding the introduction of nonnative fish to watersheds (USFWS 1997).

3.12.1 Impacts of the Proposed Action

Potential impacts on special status species would be expected to be similar for all phases of the Proposed Action. No permanent, adverse impacts on special status species are expected from the Proposed Action. As necessary, surveys for rare species would be conducted prior to ground-disturbing activities. If impacts on rare and unique natural resources cannot be completely avoided, IBR would coordinate with the appropriate regulatory agencies to minimize impacts through mitigation or other appropriate measures.

Paper-spine Cactus

It is likely that several subpopulations of this species occur within the desert scrub habitat in the Project area. Design would be engineered to avoid direct impacts on any documented occurrences, and construction crews would be directed to avoid any activity in the vicinity of the plants. Therefore, there would be no effect of the Proposed Action on this species.

Peebles Navajo Cactus

Peebles Navajo cactus could be adversely impacted by the Project if individual plants were to occur in or adjacent to the construction area. However, this affect would only occur if Peebles Navajo cactus were to occur in the Project area. Based on current knowledge of the cactus it is not expected that any occur in the project area; however, the far northeast corner of the subsequent phases portion of the Project area may have some suitable soils based on the surficial geology in this area. As such, additional studies and/or surveys would be completed if Project facilities are sited in areas of suitable habitat. Although the Project may affect, it is not likely to adversely affect Peebles Navajo cactus. The USFWS concurred with this determination in a letter to the BLM dated November 16, 2007.

Gunnison's Prairie Dog

The Proposed Action is not expected to adversely impact the Gunnison's prairie dog. Wind farm facilities would not be placed in the immediate vicinity of any known prairie dog colonies. As necessary, pre-construction surveys would be conducted when final design is complete and would document any occurrences within the vicinity of the facilities (see Section 3.11.3). Design would be engineered to minimize direct impacts on any documented prairie dog towns, and construction crews would be directed to minimize crushing any known prairie dog burrows.

One of the major concerns for this species is habitat fragmentation, the fact that the leases entered into by private landowners as part of the Proposed Action might reduce the likelihood of parcels being sold off into small parcels, which would likely benefit the species.

Little Colorado River Spinedace

The Proposed Action would not directly impact Silver Creek or the Little Colorado River, where there are known populations of the spinedace. However, the Project area is within both the Little Colorado River and Silver Creek watersheds and construction could result in indirect impacts on the species from eroded sediment reaching those water bodies if BMPs are not implemented during construction or if construction of the Proposed Action changes surface water flow patterns or erosion rates. However, the majority of the substation areas would remain as permeable surfaces, the relatively small amounts of impermeable surfaces from turbine foundations and outbuildings would be spread out over a large area, and erosion potential is not expected to be noticeably higher than under the existing land use at the sites. Sound water and soil conservation practices would be maintained during construction and operation of the Proposed Action to protect topsoil and adjacent water resources and minimize soil erosion. This includes the use of appropriate erosion control measures during construction and implementation

of the Habitat Restoration Plan after construction is completed. Structures would not be placed in washes within the Project area. A more detailed description of potential Project impacts on the Little Colorado River spinedace was presented in the Biological Assessment prepared for this project. Although the Project may affect, it is not likely to adversely affect Little Colorado River spinedace. The USFWS concurred with this determination in a letter to the BLM dated November 16, 2007.

3.12.2 Impacts of the No Action Alternative

No facilities would be built under this scenario, and therefore there would be no effect on special status species.

3.12.3 Mitigation Measures for Threatened and Endangered Species Impacts

IBR and the BLM, propose the following conservation measures be incorporated into the Project to avoid the potential for short-term (construction) or long-term (operation) effects on the protected species:

- IBR would apply for coverage under the state of AZPDES permit. IBR would be required to develop a site-specific SWPPP that include erosion prevention, soil stabilization, sediment control, and re-vegetation for each phase of development;
- IBR would develop and implement a Habitat Restoration Plan for the Project that includes provisions for re-establishing vegetation cover within construction areas immediately following construction to minimize sediment transport off-site and potential downstream impacts to water quality (see Appendix D);
- IBR and BLM with input from the USFWS would jointly survey the subsequent phases area to determine potential habitat for Peebles Navajo Cactus.
- If suitable habitat for the cactus is potentially present within the subsequent phases area where project facilities are proposed, IBR and BLM would conduct surveys for the species within the proposed construction area during the appropriate time of year.
- If Peebles Navajo cactus is found in the subsequent phases area, IBR would avoid siting turbines or project facilities in areas where cacti would be directly or indirectly impacted. In addition, IBR and BLM will implement measures to protect any populations of Peebles Navajo cactus found in the project area.
- BLM would initiate consultation with the USFWS, as appropriate, if Peebles Navajo cactus is found anywhere in the project area.

3.13 LAND USE

The land use analysis for the Project area was compiled by reviewing USGS topographic quadrangle maps, selected aerial photography, and agency-specific jurisdiction maps. The mapped information was verified by aerial reconnaissance on May 22, 2007, and ground

reconnaissance on June 5, 2007. In addition, federal, state, and local land resource agencies and organizations were contacted to update official information.

Land Jurisdiction and Ownership

Phase I

Phase I of the Project area encompasses a total of approximately 17,000 acres of land either privately owned or under the jurisdiction of BLM or the Arizona State Land Department (ASLD). Approximately 6,600 acres are BLM-administered, 3,000 acres are ASLD-administered and 7,400 acres are privately owned.

Subsequent Phases

The eastern portion of the Proposed Action encompasses 32,500 acres, of which approximately 7,040 acres are BLM-administered, 6,400 acres are ASLD-administered and 19,060 acres are privately owned.

Land Use Planning Documents

Included below is information on regulations, current plans, programs, and policies designed to guide land use in the Project area.

Navajo County Comprehensive Plan

Navajo County drafted and adopted its comprehensive plan in response to Arizona's 1998 Growing Smarter Act. This act requires municipalities and counties to better manage growth by providing a statewide comprehensive approach to improving the process of growth within Arizona. While most comprehensive plans apply designated land uses to certain areas, the Navajo County Comprehensive Plan uses the concept of "character areas." Character areas are promoted as more appropriate for the primarily rural character of Navajo County and are intended to "represent generalized land use, development, or preservation concepts that recognize and promote existing development patterns" (Navajo County Public Works Department – Planning and Zoning 2004).

The Project area is designated as Rural Edge character area. Rural Edge is intended to support lower density residential development and some commercial uses. Because the comprehensive plan is intended to guide growth in Navajo County, not regulate it, development in the Rural Edge character area can proceed in accordance with the current zoning classification and Navajo County zoning laws. As part of the plan's land use element, access to wind energy for all character areas is encouraged.

Navajo County Zoning Ordinance

The Navajo County Zoning Ordinance, adopted in 1974, is the controlling land use document for privately owned land in the Project area. Land in the Project area is zoned either A-General or Rural-20. The A-General classification is for unincorporated county land without a previous zoning designation. Rural-20, where 20 acres is the minimum lot size, is designed to "conserve

and protect open land uses, foster orderly growth in rural areas, and prevent urban agricultural land use conflicts" (Navajo County 1974).

Both zoning classifications allow for utility delivery facilities, but not for generating plants, major facilities, towers, or stations. Utility appurtenances are not allowed under A-General or Rural-20 require special use permits prior to construction and operation. Electric power generating plants (either nuclear or fossil fuel) may be permitted as a special use. The zoning ordinance does not address wind-powered energy production; the Special Use Permit for a preliminary layout of the Proposed Action has, however, been approved by the Navajo County Board of Supervisors.

BLM

Federal lands within the Project area, while administered by the BLM's Safford Field Office, is addressed in the Phoenix RMP/FEIS. The Phoenix RMP/FEIS identifies resource conservation areas, utility corridors, ACECs, special management areas, and cooperative recreation management areas in the Phoenix RMP/FEIS boundary. BLM lands within the Project area, while managed for multiple uses, are not included in any of these special designations. No elements of the BLM National Landscape Conservation System are located within the Project area.

Existing Land Use

Figure 3-6 shows existing land use in the Project area. The area is characterized by flat, vacant rangeland with few structural improvements. No residences or commercial buildings are located within the Project area.

Phase I

The primary land use is livestock grazing on vacant rangeland. All of the BLM-managed land in Phase I have grazing leases in place, which are valid until 2009 and in some cases up to 2016. The names of the BLM grazing allotments are Dry Lake (# 06037), Pink Cliffs (# 06058), and Hidden Lake (# 06184). Under five active grazing leases, 84 percent (2,520 acres) of the ASLD land is leased for grazing until November 2012; the balance (480 acres) is leased until December 2008. Several watering tanks and corrals have been constructed to support grazing operations. Additionally, the flyover indicated that there are two pig quarantine facilities, located in Section 3 of Township 14N, Range 19E. Generally, cattle are rotated in the area following a seasonal suitability or best pasture grazing system where grazing intensities and areas change based on seasonal precipitation and forage production.

Other land uses include transportation and utility corridors and facilities. For the State Highway 377 transportation corridor, the Arizona Department of Transportation (ADOT) owns the ROW on privately owned land and holds an easement across BLM land. APS has a utility easement for the Cholla-Zeniff 69-kV transmission line. Both corridors traverse the western portion of the Project area. AT&T has a communications tower approximately 1.5 mile east of

State Highway 377. IBR owns seven temporary meteorological towers currently scattered across the Project area.

In addition, the flyover revealed that the AGFD has constructed an "antelope water" on BLM land; it consists of a fenced stock pond covered with a concrete roof to minimize evaporation. Finally, the BLM land could also be used for recreation. Recreation use indicators reflect low use throughout the project area. Hunting is speculated as the primary use for the area. In the general Project area, the BLM has issued seven Special Recreation Permits (SRPs) to the following recreational outfitters:

- National Outdoor Leadership School
- Nichols Guiding Service
- Wild Bill Guide Service
- U.S. Outfitters
- Double H Outfitters
- Anasazi Foundation
- Harris Outfitters and Guide Service

These SRPs were issued for the region and contain the Project area within the overall legal description. As such, there is the potential for recreational use within the Project area. However, given the predominance of grazing, the limited number of publicly owned areas, and the limited access to the publicly owned parcels, the area is not widely used or expected to be used for recreational purposes.

Subsequent Phases

Similar to Phase I, the primary land use in the eastern portion of the Project area is livestock grazing on vacant rangeland. All of the ASLD land is currently leased for grazing until November 2012. Within the eastern portion of the Project area, all of the BLM-managed lands have grazing leases in place, with valid dates ranging between 2009 and 2016. The names of the BLM grazing allotments are Monument Hill (# 06179), The Divide (# 06052), and F-Bar (# 06047). There is a pig farm operation in the eastern portion of the Project area.

Planned Land Use

The Navajo County Comprehensive Plan and the zoning ordinance allow for development to intensify on private land within the Project area. However, the amount of land currently used for grazing by one entity and the longevity of the grazing leases on ASLD and BLM land, indicates that grazing is envisioned to continue as the primary land use. Approximately 13,200 acres, or 78 percent of the Phase I area, is either owned or leased by Rocking Chair Ranch, Inc. Navajo County's commitment to expanding its energy production capabilities is evidenced by the approved Special Use Permit for the Proposed Action.

Phase I

Some recent subdivision of private land reveals the potential for low-density, single-family homes to be built in the future. Figure 3-7 shows the location of Northern Sky Ranch, a marketed subdivision containing 14 contiguous lots immediately north of the Phase I boundary and other areas of privately owned subdivided land. There is a parcel located in Section 5 of Township 15N, Range 20E that is currently for sale as a horse ranching property.

Although there is currently no evidence of active mining in the area, there is some minor potential for mining salt, potassium (potash), and/or oil and gas within Phase I of the Project area in the future. NZ Minerals, LLC, owns the mineral rights to approximately 4,500 acres of privately owned land in the Phase I area (Figure 3-7). A review of BLM records shows no active federal mining claims within the Project area. See Section 3.2 for a description of mineral potential in the Project area.

Subsequent Phases

There is the potential for low-density, single-family homes to be built in the future within the eastern portion of the Project area. Figure 3-7 shows the location of Snowflake Ranches, a platted subdivision in Sections 17 and 21 of Township 14N Range 21E.

A low potential for mining (salt, potash, and/or oil and gas) also exists in the eastern portion of the Project area. The Aztec Land & Cattle Company owns the mineral rights to approximately 7,040 acres of privately owned land within the eastern portion of the Project boundary. Although there is currently some exploration for oil and gas in the general area, there are currently no mining operations within the Project boundary. As with the Phase I project area, there are no active federal mining claims with the subsequent phases portion of the Project area (see Section 3.2).

3.13.1 Impacts of the Proposed Action

The anticipated effects of the Proposed Action were compared with the existing environment to determine impacts on land use resources. Planning documents were also reviewed to evaluate the conformance of the Proposed Action with guidance or regulations. Potential impacts would be expected to be similar for all phases of the Proposed Action.

With respect to compatibility with the Navajo County Comprehensive Plan, construction and operation of the Proposed Action would introduce a commercial utility land use that is more intense than the defined purpose of the Rural Edge character area. The defined purpose of the character area is to “provide lower density residential development.” An indirect land use impact may result from the Proposed Action, decreasing the perceived attractiveness of adjacent land for residential development and thereby changing the character of the area. However, operation of the Proposed Action would not generate much traffic or significantly increase day-to-day human activity in the area. Therefore, the Project area would retain the rural sense and remote character.

Section 3.18.1 discusses potential impacts on property values from wind energy projects in more detail.

As described in the previous section, the Special Use Permit for a preliminary layout of the Proposed Action has already been approved. Therefore, the Proposed Action is compatible with the Navajo County Zoning Ordinance.

Construction and Operation Impacts on Existing Land Use

Figure 3-8 depicts potential land use conflicts in the Project area. Primary impacts on existing land use would occur on BLM, ASLD, and privately owned land currently used for grazing. For Phase I, up to 30 turbines, the Project substation, O&M facility, and approximately 12 miles of access roads and 11 miles of collector cable (aerial and buried) would be constructed in leased grazing areas. Construction of the Proposed Action would temporarily disrupt grazing patterns within the Project area during turbine and collector line installation and access road improvements. Cattle and other livestock would need to be removed from the most intensive construction areas. In addition, grazing land would be permanently removed for the turbine, road, and support facility footprints (approximately 32 acres for Phase I, and approximately 113 to 217 acres for subsequent phases). This equates to about 0.5 and 1.8 percent of the state and federal land available in the Phase I and subsequent phase areas, respectively.

Areas temporarily disturbed would be restored to their original condition and livestock grazing could continue around the wind turbine complex. Construction would be phased to coordinate with livestock rotation and minimize impacts on grazing operations, and communication with landowners and/or ranchers could prevent conflicts during ongoing maintenance. Any fencing that is affected during construction would be repaired to landowner specifications, and landowners would be compensated for any damage to their grazing operations. As appropriate, cattle guards would be used to minimize impacts of the access road system on ongoing grazing operations.

The existing 690 kV transmission line could be temporarily affected during construction of the Proposed Action by the connection of the new collector line and substation to the existing line. However, no service interruptions would be required.

While current private landowners would continue to maintain access to their properties, existing or new gates would be used to prevent the general public from accessing the Project area. As such, the quality of hunting or other recreational use of the Project area would be minimally affected by the Proposed Action (refer to Section 3.11 for impacts on Wildlife Habitat).

The Proposed Action is not expected to conflict with the pig quarantine facilities in Section 3 of Township 14N, Range 19E. The project components would not impact these facilities.

Construction and Operation Impacts on Planned Land Use

Figure 3-8 depicts potential land use conflicts in the Project area. The primary source of potential conflicts during construction and operation is from planned land uses within the Project area. The ownership of mineral rights on privately owned land - approximately 4,500 acres within Phase I and approximately 7,040 acres within the eastern portion of the Project area - indicates that mining activities are possible within the Project area. For Phase I, 14 turbines would be located in areas where mineral rights are held. It is likely that subsequent phases of the Proposed Action could also occur in areas where mineral rights are held. At this time, there is no information available to suggest that the Proposed Action would preclude future mineral extraction – particularly since salt and oil and gas extraction would not require open pit mining (as would potash extraction).

One platted subdivision, the Northern Sky Ranch subdivision north of the Phase I boundary, would be located in the vicinity of the Proposed Action. Similarly, the platted Snowflake Ranches subdivision is located in the eastern portion of the Project area. While platted as subdivisions, these properties are currently undeveloped and there is no indication that construction in these areas is planned in the foreseeable future. While Project turbines would be visible from these properties, IBR would not construct wind turbines closer than 500 feet from property lines of landowners not participating in development of the Project.

The wind turbines would be compatible with other livestock and grazing operations in the area and therefore would not affect planned land use.

3.13.2 Impacts of the No Action Alternative

Under the No Action Alternative, the facility would not be constructed and existing land uses in the Project area would continue without the influence of the Proposed Action.

3.13.3 Mitigation Measures for Land Use Impacts

Any existing fencing affected during construction of the Proposed Action would be repaired to landowner specifications (including the potential use of cattle guards), and landowners would be compensated for any damage to their grazing operations.

3.14 VISUAL RESOURCES

The BLM, Safford Field Office completed a visual resource inventory to determine the appropriate visual management objective for the Project area following the BLM's Manual H-8410-1 - Visual Resource Inventory (BLM 1986a). The visual resource inventory provides a means for determining visual values. The inventory consists of a scenic quality evaluation, sensitivity level analysis, and establishing distance zones (see Appendix B, page 9). Based on these three factors public lands are placed into one of four visual resource management classes. These classes represent the relative value for visual resources. Classes I and II being the most valued, Class III representing a moderate value, and Class IV being of lesser value. The Project area is designated visual resource management Class IV. The management objective for Class IV

areas allows management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

HDR Engineering conducted a visual resource analysis for the Project that describes current visual conditions and identifies potential impacts on the aesthetic environment from the Proposed Action. The visual study includes an evaluation of existing visual conditions, such as landscape character and scenic quality as well as an impact assessment that considers visual contrast ratings and viewer sensitivity. This visual study was completed using the BLM's Visual Resource Management system methodologies. A detailed description of the visual resource assessment prepared for the Dry Lake Wind Project is included in Appendix B.

3.14.1 Impacts of the Proposed Action

Construction of the Project, including equipment movement and activities associated with road improvements and turbine installation, could impact visual quality of the landscape. However, much of the visual impacts resulting from the Project would be most noticeable after construction is completed and the Project begins operation. Appendix B (Section 3.5) provides an in-depth analysis of the potential visual impacts of the Proposed Action. Although up to 492 feet tall, the wind turbines would not generally be visible from Snowflake or Holbrook. Views of the turbines would be most evident to the general public from points along State Highways 377 and 77 (Figure 2 of Appendix B). Turbines would be painted with a non-reflective white paint that would not substantially contrast with the skyline background.

In addition to being visible during the day, Federal Aviation Administration (FAA) requirements for lighting turbines would result in approximately one third to one half of the structures being lit with white or red flashing lights (mounted on wind turbine nacelle) that would be visible from the state highways at night.

Aboveground collector lines would blend in with the Project and would not create additional visual impacts. Based on the preliminary collector line layout, the overhead collector lines would primarily be located in the middle of the Project area in between turbine strings. At its closest point, the overhead lines would be more than 3 miles from State Highway 377 and further from the highway than turbines. As such, views of the aboveground collector lines would be only slightly noticeable in the context of the overall environment.

Other Project facilities, including roads, the substation, and O&M facility, would cause some landscape contrast because of the color contrast of the disturbed topsoil and addition of new structures to the landscape. However, the overall impacts of these facilities on the landscape would be minor because they would be located on a landscape outside of highly sensitive viewing areas, disturbances to soil and vegetation within temporary work areas would be

restored after construction is complete, and the existing scenic quality would remain within the VRM Class IV objective.

3.14.2 Impacts of the No Action Alternative

No impacts on current visual conditions would occur without the influence of the Proposed Action.

3.14.3 Mitigation Measures for Visual Resource Impacts

In addition to locating the wind energy facilities outside of highly sensitive viewing areas, an extensive planning effort for mitigation measures has been made to minimize potential visual disruption during the construction and operation of the Proposed Action. When construction requires movement of earth during windy conditions, water or chemicals would be used for dust suppression.

Because of the structural nature of the wind turbines and turbine arrays, the design of the proposed facility would be integrated with the surrounding landscape. Visual uniformity has been taken into consideration as a design element, and the structures would be constructed as tubular towers, painted with non-reflective white paints. FAA requires that structures over a certain height have red or white flashing lights. These lights would be mounted at the nacelle of the wind turbine, and located at the ends and middles of the turbine strings. Additional lighting at the substation and O&M facility would be limited to reduce nighttime light pollution (e.g., motion detector lights and downcast lighting).

3.15 CULTURAL RESOURCES

The National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. 470) requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the State Historic Preservation Office (SHPO) and other parties with a demonstrated interest a reasonable opportunity to comment on such undertakings. Regulations for *Protection of Historic Properties* (36 CFR Part 800) implement Section 106 of the NHPA. These regulations define a process for responsible federal agencies to consult with the SHPO or Tribal Historic Preservation Officer, Native American groups, other interested parties, and when necessary, the Advisory Council on Historic Preservation (ACHP) to ensure that historic properties are duly considered as federal projects are planned and implemented.

To be determined eligible for inclusion in the National Register of Historic Places (NRHP), properties must be important in American history, architecture, archaeology, engineering, or culture. In addition, properties must possess integrity of location, design, settings, materials, workmanship, feeling, and association, and meet at least one of four criteria:

Criterion A: Be associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B: Be associated with the lives of persons significant in our past.

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction.

Criterion D: Have yielded, or may be likely to yield, information important in prehistory or history.

Properties may be of local, state, or national importance. Typically, historic properties are at least 50 years old, but younger properties may be considered for listing if they are of exceptional importance.

Although the Proposed Action qualifies as a federal undertaking, it must also adhere to State preservation compliance requirements. The State Historic Preservation Act of 1982 (A.R.S 41-861 through 41-864) stipulates that state agencies work to identify and preserve significant historic properties and provides SHPO an opportunity to comment on any agency plans that affect properties listed on or eligible for listing on the Arizona State Register of Historic Places. In addition, the Arizona Antiquities Act (A.R.S. 41-841 through 41-847) prohibits excavation of historic or prehistoric sites on lands owned or controlled by the State of Arizona or local governments without a permit. The Act also directs those in charge of activities on such lands to notify the director of the Arizona State Museum of the discovery of any archaeological sites, historical resources, or human remains.

Given the regulatory requirements described above, IBR completed a records search of recorded archeological sites and historic properties in the area, as well as an archeological survey of the areas of proposed ground disturbance within the Phase I footprint. Additionally, archeological surveys of the subsequent phases would be completed prior to final facility design and layout.

Phase I

IBR has completed two Class III cultural resource surveys for the Phase I area – one survey was completed in the summer of 2007 and one survey was completed in the summer of 2008. The Class III cultural resources surveys included 800-foot-wide corridors along the turbine string lines, 200-foot-wide corridors along access roads, overhead and underground connector lines, 4 acres for an operations and maintenance facility, and 2 acres for a substation facility. The surveys included the 800-foot-wide and 200-foot-wide corridors so that if significant cultural resources were identified, the facilities layout could be reconfigured to avoid impacting the sites. Thus, the Class III survey area defined the Project area of potential effect (APE).

The results of the 2007 Class III survey are reported in *A Class III Cultural Resources Survey for Phase I of the Dry Lake Wind Project, Western Section, Navajo County, Arizona*. The survey identified 25 prehistoric sites and one historic site in the APE. The sites included 10 lithic scatters, 9 artifact scatters and 6 habitation sites, as shown in Table 3.15-1.

Although temporally diagnostic artifacts were generally lacking at the lithic scatter sites, many could be associated with the Archaic Period. Four of the lithic scatters, Sites A, L, M, and P consisted of deflated surface concentrations lacking subsurface depth. The sites' information potential was exhausted through survey recording; therefore, they are recommended as not eligible for listing in the NRHP. The other six lithic scatters, Sites B, D, O, W, HH, and II, represent possible habitation, resource procurement, and/or limited activity sites with potential for subsurface depth. The sites are in good condition and therefore are considered eligible for listing in the NRHP for their potential to provide important information on the prehistory of the region, and, in particular, possible patterns of Archaic Period settlement and land use.

Sites E, G, K, Q, Y, and AA are early Formative Period habitation sites defined by the remains of small pueblo architecture. Decorated ceramic shards at the sites indicate associations with P-I and P-II periods (ca. A.D. 700-900), although early Basketmaker components could also be present. The habitation sites are in good condition and have potential for subsurface cultural features and deposits. The sites are recommended eligible to listing in the NRHP under Criterion D for their potential to provide important information on early Formative Period settlement and land use on the Colorado Plateau.

Sites C, F, H, IJ, S, TV, U, X, and Z are prehistoric surface scatter combinations of ceramic sherds, lithics, and other artifact types. The sites appear to represent small habitations or activity areas. Decorated ceramic sherds observed at these sites indicate associations with P-I and P-II periods (ca. A.D. 700-900). Earlier Basketmaker components could also be present. The sites are in good condition and have potential for subsurface cultural deposits and features. The artifact scatter sites are recommended eligible for listing in the NRHP under Criterion D for their potential to provide important information prehistoric settlement and land use on the Colorado Plateau, and in particular cultural patterns defining the early Formative Period.

Site R was the only historic site identified by the Class III survey. The site consists of a rock cairn with mounded soil. Associated artifacts included a faunal bone fragment and broken brown glass. The site's function is unknown. Because it is in good condition and it has potential for buried cultural deposits, it is recommended as eligible to the NRHP.

Based on the results of the 2007 Class III survey, the configuration of the Phase I layout was adapted to avoid all the archaeological sites determined eligible for the NRHP. Because the Project would not result in an adverse effect to eligible cultural resources, the BLM recommended that a finding of "no adverse effect" is appropriate for this undertaking. In a letter to the BLM dated October 23, 2007, the SHPO concurred with the determinations of eligibility for the Project and supported the plan to avoid Register-eligible sites through Project design.

Given the latest project layout (partially resulting from the reconfiguration of facilities to avoid archaeological sites), another Class III survey was conducted in 2008. A report documenting the results of this survey is still under development. However, preliminary results of the survey

suggest that archaeological sites determined eligible for the NRHP would be avoided. Prior to issuing a Notice to Proceed, the BLM would review the 2008 Class III survey report to confirm that the final project design avoids all Register-eligible sites.

Table 3.15-1
Results of the 2007 Cultural Resources Survey for Phase I

Site	Type	Age	Jurisdiction	National Register Recommendation
A	Lithic scatter	Prehistoric, possibly Archaic	ASLD	Not Eligible
B	Lithic scatter	Prehistoric, possibly Archaic	ASLD	Eligible
C	Artifact scatter	Prehistoric (ca. P-I)	Private	Eligible
D	Lithic scatter	Prehistoric, possibly Archaic	ASLD	Eligible
E	Habitation site with structure	Prehistoric (ca. PI/II)	Private	Eligible
F	Artifact scatter	Prehistoric (ca. PI/II)	Private	Eligible
G	Habitation site with structure	Prehistoric (ca. PI/II)	Private	Eligible
H	Artifact scatter	Prehistoric (ca. PI/II)	Private	Eligible
IJ	Artifact scatter	Prehistoric (ca. PI/II)	Private	Eligible
K	Habitation site with structure	Prehistoric (ca. PI/II)	Private	Eligible
L	Lithic scatter	Prehistoric, possibly Archaic	Private	Not eligible
M	Lithic scatter	Prehistoric, possibly Archaic	Private	Not Eligible
O	Lithic scatter	Prehistoric, possibly Archaic	Private	Eligible
P	Lithic scatter	Prehistoric, possibly Archaic	Private	Not eligible
Q	Habitation site with structure	Prehistoric (ca. PI/PII)	BLM	Eligible
R	Rock cairn	Unknown, likely historic	Private	Eligible
S	Artifact scatter	Prehistoric (ca. P-I/II)	ASLD	Eligible
TV	Artifact scatter	Prehistoric (ca. P-I/II)	ASLD	Eligible

Site	Type	Age	Jurisdiction	National Register Recommendation
U	Artifact scatter	Prehistoric (ca. P-I/II)	ASLD	Eligible
W	Lithic scatter	Prehistoric (ca. BMII-PII)	Private	Eligible
X	Artifact scatter with possible structure	Prehistoric (ca. P-I/II)	Private	Eligible
Y	Habitation site with structure	Prehistoric (ca. BMII-PII)	ASLD	Eligible
Z	Artifact scatter	Prehistoric (ca. P-I/II)	Private	Eligible
AA	Habitation site with structures	Prehistoric (ca. P-I/II)	Private	Eligible
HH	Lithic scatter	Prehistoric, possibly Archaic	BLM	Eligible
II	Lithic scatter	Prehistoric, possibly Archaic	BLM	Eligible

Subsequent Phases

A Class I overview was prepared for the subsequent phases portion of the Project area. The Class I records check indicated that this portion of the Project area is largely unsurveyed. Based on the results of the few surveys that have been completed, the discovery of evidence of a relatively intensive prehistoric use and occupation is anticipated. Class III surveys similar to those conducted for Phase I of the Proposed Action would occur for all subsequent phases prior to finalizing the Project layout.

3.15.1 Impacts of the Proposed Action

IBR is committed to conducting Class III archeological surveys of all areas affected by the Project and avoiding disturbances to all sites eligible for listing in the NRHP. Already, IBR has begun evaluating the current Project configuration for the Phase I Project area and believes it can design its Project to fully avoid the eligible sites identified thus far. Similarly, the layout of subsequent phases would be adjusted to avoid impacting eligible cultural resource sites. Consequently, the Proposed Action is not expected to result in significant impacts on cultural resources.

3.15.2 Impacts of the No Action Alternative

Under this alternative, the Proposed Action would not be built, and no impacts on cultural resources would occur.

3.15.3 Mitigation Measures for Cultural Resources Impacts

As noted above, IBR is committed to conducting Class III archeological surveys of all areas affected by the Project and avoiding disturbances to all sites eligible for listing in the NRHP. Should any archaeological resources or vertebrate fossils be discovered during implementation of this Project, all surface disturbing activities in the area of discovery would cease. A Project archeologist would evaluate the discovery and provide recommendations to the BLM's Authorized Officer. Surface disturbing activities would not resume until permission is obtained from the BLM's Authorized Officer.

3.16 AIR QUALITY

The Proposed Action is located approximately 12 miles south of Holbrook, Arizona, in the southern reaches of the Colorado Plateau, at about 1 mile above sea level. The climate of the area is arid, with cool winters and warm to hot summers. Mid-winter temperatures average in the upper 40s, and mid-summer temperatures average in the lower 90s. Average annual precipitation at Holbrook is between 8 and 9 inches, with an average of just over 8 inches of snow per year. Nearly half of the average annual precipitation falls in thunderstorms during the summer monsoon season of July through September.

Visibility is generally very good in the region, except during occasional dust storms or when regional forest fires are prevalent.

Air quality in Navajo County is generally good, with the entire county currently designated at "attainment" with respect to the National Ambient Air Quality Standards (NAAQS), which are listed in Table 3.16-1. Arizona state air quality standards are the same as the NAAQS. The only NAAQS non-attainment areas in Arizona are in southern portion of the state, far from the Project area.

The only air quality monitoring data reported by the U.S. Environmental Protection Agency (EPA) within the past five years is for particulate matter under 10 microns in diameter (PM_{10}) in the town of Show Low, approximately 25 miles southeast of the Project area, and for ozone (O_3) at the southwest entrance of the Petrified Forest National Park, approximately 15 miles northeast of the Project area (EPA 2007).

For PM_{10}, the maximum measured 24-hour concentration at Show Low from 2002 through 2006 was 58 micrograms per cubic meter ($\mu g/m^3$), compared to the 24-hour NAAQS of 150 $\mu g/m^3$. The maximum measured annual average concentration during this period was 18 $\mu g/m^3$, compared to the corresponding NAAQS of 50 $\mu g/m^3$. While the annual average PM_{10} NAAQS was in place during most of the period of monitoring described here, the EPA deleted the annual PM_{10} standard in late 2006.

Under the federal Clean Air Act, special protection of air quality and visibility is given to certain national parks and wilderness areas, designated as "Class I" areas. The nearest such area to the Project is the Petrified Forest National Park, the nearest point of which is approximately 15 miles northeast of the Project area.

For ozone, measured concentrations were closer to the NAAQS of 0.08 parts per million (ppm). An exceedance of the 8-hour O_3 NAAQS is determined when the concentration is 0.085 ppm or greater. During the past 5 years of data (2002-2006), monitoring at the Petrified Forest National Park detected one exceedance of the NAAQS, measuring 0.085 ppm in 2006. Because the O_3 NAAQS is a 99th percentile standard, up to three exceedances are allowed at one location in a calendar year. A 4th exceedance would be considered a violation of the NAAQS.

Table 3.16-1
National and State Ambient Air Quality Standards

Pollutant	NAAQS	AZAAQS	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m$^{3)}$	9 ppm	8-hour[1]	None
	35 ppm (40 mg/m^3)	23 ppm	1-hour[1]	None
Lead	1.5 µg/m^3	1.5 µg/m^3	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	0.05 ppm	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM_{10})	150 µg/m^3	150 µg/m^3	24-hour[1]	-
Particulate Matter ($PM_{2.5}$)	15 µg/m^3	-	Annual (Arithmetic Mean)[2]	Same as Primary
Ozone	0.08 ppm	-	8-hour[3]	Same as Primary
Sulfur Oxides	0.03 ppm	0.02 ppm	Annual (Arithmetic Mean)	-
	0.14 ppm	0.10 ppm	24-hour[1]	-
	-	-	3-hour[1]	0.5 ppm (1,300 µg/m^3)
	-	0.50 ppm	1-hour	-

[1]Not to be exceeded more than once per year
[2]To attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15 µg/m^3
[3]To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm

3.16.1 Impacts of the Proposed Action

Fugitive dust and exhaust emissions from construction equipment and vehicles associated with the Proposed Action could potentially impact air quality. Emissions from construction would be

confined to daytime activity for the duration of the 9- to 12-month construction period for each Project phase. Air quality impacts from operations and maintenance activities are expected to be very short in duration and would not significantly affect overall ambient air quality.

Based on EPA's *AP-42: Compilation of Air Pollution Emission Factors* (EPA 1995), approximate emission factors for each construction phase are conservatively estimated at 1.2 tons/acre/month for total suspended particulate (TSP) over the area of soil disturbance during construction.

Construction of a wind farm typically can be accomplished by disturbing relatively small parcels of land around the location of each wind tower, including access roads to each parcel. Implementation of BMPs and other measures (e.g., water spraying, revegetation) would minimize fugitive dust. Fugitive dust must be controlled in accordance with the following sections of Arizona rules, under Title 18, Environmental Quality.

- R18-2-604. Open Areas, Dry Washes, or Riverbeds
- R18-2-605. Roadways and Streets
- R18-2-606. Material Handling
- R18-2-607. Storage Piles

These rules require that BMPs, including wetting or other dust control measures, be applied to prevent avoidable amounts of fugitive dust from leaving a construction site. With application of such measures to the proposed construction, it is anticipated that impacts at the Petrified Forest Nation Park, approximately 15 miles northeast of the area, would be negligible.

The Wind Energy PEIS (BLM 2005) states that the operation of a wind energy development project would not adversely impact air quality. Vehicle travel and maintenance activities might generate minor tailpipe emissions and fugitive dust, but these activities would be limited in extent and should have no appreciable air quality impacts (i.e., measurable, but not triggering significance criteria) during any phase of wind farm operations or decommissioning. Operating wind turbines do not produce emissions. There could be some minor Volatile Organic Compound (VOC) emissions during routine changes in lubricating and cooling fluids and greases. The other operations would generate fugitive dust from road travel and vehicular exhaust. All activities would be limited in extent and duration and should have an insignificant impact on air quality.

3.16.2 Impacts of the No Action Alternative

Under the No Action Alternative, there would be no direct impacts on local air quality, because the Proposed Action would not be built.

3.16.3 Mitigation Measures for Air Quality Impacts

Because no significant impacts on air quality would occur, mitigation measures beyond the BMPs (e.g., fugitive dust control) described above are not necessary or proposed.

3.17 NOISE

The Project area for noise was focused on potential human receptors within the Proposed Action boundaries: generally residences within 1,000 feet of the Proposed Action. Noise is defined as unwanted sound. The unit used to describe the intensity of sound is the decibel (dB). The dBA scale is A-weighted decibels based on the range of human hearing. Noise issues and potential impacts on wildlife, including big game such as pronghorn antelope, are discussed in Section 3.11.

There are no federal noise standards that directly regulate wind turbine or substation noise. However, to protect public health and welfare, the EPA has developed guidelines on recommended maximum noise levels. There are no local regulations or ordinances for noise in Navajo County (Navajo County 1974). EPA guidelines recommend a day-night average sound level (Ldn) of 55 dBA in typically quiet outdoor and residential areas. An additional noise guideline in Arizona is the 64-dBA threshold that the Arizona Department of Transportation uses to initiate mitigation measures for highway noise. However, these levels are guidelines, not requirements.

In general, a 3-dBA increase in noise is considered barely noticeable to humans, a 5-dBA increase is clearly noticeable, and a 10-dBA increase is considered a doubling of the sound level. In the Project area, background noise levels are typical of those in rural settings, where existing noise levels are commonly in the 30-40 dBA range. Higher levels exist near roads such as State Highways 77 and 377. The BLM's Wind Energy PEIS notes that on BLM-administered lands, large fluctuations in noise are common (BLM 2005).

3.17.1 Impacts of the Proposed Action

Construction Noise

Noise levels associated with construction of a wind farm would vary greatly depending on the type of equipment, construction schedule, and condition of the area being worked. Similar construction equipment would be used during all phases of the Proposed Action, so it is assumed that potential noise impacts would also be similar. Noise levels for typical construction equipment, including vehicles and batch plant equipment, are shown in Table 3.17-1.

Table 3.17-1
Typical Construction Noise Levels

Construction Equipment	Noise Level ($L_{eq(1\text{-}h)}$[a]) [dBA]					
	50 ft	250 ft	500 ft	1,000 ft	2,500 ft	5,000 ft
Bulldozer	85	71	65	59	51	45
Concrete mixer	85	71	65	59	51	45
Concrete pump	82	68	62	56	48	42
Crane, derrick	88	74	68	62	54	48
Front-end loader	85	71	65	59	51	45
Generator	81	67	61	55	47	41
Grader	85	71	65	59	51	45
Truck	88	74	68	62	54	48

Source: BLM, 2005
[a] ($L_{eq(1\text{-}h)}$) [dBA] is the equivalent steady-state sound level that contains the same varying sound level during a 1-hour period

Noise levels for hourly traffic would generally be below the EPA guideline of 55 dBA and ADOT's 64 dBA guideline except in close proximity to the road.

There are isolated residences in the vicinity of the Project area; the closest is approximately 3 miles north of the Phase I boundary. It is possible that construction noise would be audible in residential yards outside the Project area; however, due to its temporary nature and the long distances between occupied residences and facility components, significant noise impacts are not expected during construction.

Operation Noise

When in motion, the wind turbines emit a perceptible sound. The level of this noise varies with the speed of the turbine and the distance of the listener from the turbine. On relatively windy days, the turbines create more noise; however, the ambient or natural wind noise level tends to override the turbine noise as distance from the turbines increases.

The wind turbines would create sources of additional noise. For the noise evaluation, representative sound power levels were used of the GE 1.5 MW, the Suzlon 2.1 MW and Vestas 3.0 MW wind turbines that were provided by the manufacturers. Since the noise levels provided did not include any time-weighted average sound levels, the sound power levels at the turbine hub of 104.5 dBA for the 1.5 MW turbine, 107.4 dBA for the 2.1 MW turbine, and 106.7 dBA for the 3.0 MW turbine were converted to sound pressure levels and compared to the EPA and ADOT guidelines.

The maximum distances calculated where an exceedance of the EPA 55 dBA guideline would no longer occur would be approximately 400 feet for the 1.5 MW turbine and 500 feet for the 2.1 MW and 3.0 MW turbines. Maximum distances where an exceedance of the ADOT 64 dBA

guideline would no longer occur would be approximately 150 feet for the 1.5 MW turbine and 200 feet for the 2.1 MW and 3.0 MW turbines.

Turbines would not be placed within 500 feet of occupied residences; therefore, no significant noise impacts are expected to occur.

Substation Noise

In general, substation noise is not expected to be audible above background levels at distances greater than 0.5 miles. Due to the extremely isolated nature of residences in the vicinity of the Project area, no significant noise impacts are expected to occur from the operation of Project substations.

3.17.2 Impacts of the No Action Alternative

Under the No Action Alternative, no changes to the existing background noise levels would occur.

3.17.3 Mitigation Measures for Noise Impacts

Because of the distance to any residences from turbines associated with the Proposed Action, significant adverse impacts on nearby residences and occupied buildings from noise are not expected.

All construction equipment used would be adequately muffled and maintained. All stationary construction equipment (i.e., compressors and generators) would be located as far as practicable from nearby residences. Based on the results of geotechnical analyses and final facility siting, it may be necessary to use explosives to assist with rock excavation. If blasting or other noisy activities are required during the construction period, nearby residents would be notified in advance.

3.18 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

Socioeconomic and environmental justice considerations were examined through the use of block group-level 2000 Census data. The Proposed Action lies within portions of two block groups. Census Tract 9602-Block Group 1 extends north beyond the Project area boundary and includes a portion of Holbrook (census blocks 1209, 1210, 1211, 1214, 1219, and 1220), while Census Tract 9609-Block Group 3 extends south beyond the Project area boundary and includes a portion of Snowflake (census blocks 3005, 3016, 3017, 3018, 3021, 3238, and 3239) (U.S. Census Bureau 2000). There are no occupied residences within the Project area's boundaries. Given the absence of residents, limited direct impacts on people could occur. The potential for indirect socioeconomic impacts on people would likely be a result of the landscape's changed appearance, the presence of a new land use (energy generation), and economic impacts from changes to the work force and tax base. Business patterns and economic impacts, therefore, are evaluated along with an analysis of the composition of the two block groups in the Project area with respect to environmental justice considerations.

Business Patterns

Holbrook supports an estimated 139 business establishments and employs approximately 1,664 people. The primary industry is accommodations and food services (45 percent of the workforce), followed by retail trade (26 percent) and healthcare and social assistance (14 percent) (U.S. Census Bureau 2004). Annual payroll for Holbrook in 2004 was approximately $44,086,000 (U.S. Census Bureau 2004).

Snowflake has an estimated 159 establishments, with an employment total (1,664) the same as Holbrook's. Construction (28 percent of the workforce) and retail trade (27 percent) are the primary industries, followed by other services (19 percent), manufacturing (12 percent), healthcare and social services (12 percent), transportation and warehousing (10 percent), and accommodations and food service (10 percent) (U.S. Census Bureau 2004). Annual payroll for Snowflake in 2004 was approximately $55,272,000 (U.S. Census Bureau 2004). Snowflake's more diversified economy and greater payroll reflect its lesser reliance on tourist and commercial traffic generated from U.S. Interstate 40, which is the mainstay of Holbrook's economy.

Environmental Justice

Executive Order 12898 requires federal agencies to address disproportionately high and adverse human health and environmental effects of their actions, programs, and policies on minority and low-income populations. The three primary steps in assessing environmental justice issues are to determine: 1) the geographic distribution of low-income and minority populations; 2) whether any impacts would be high and adverse; and 3) whether these impacts would disproportionately affect the low-income and minority populations.

To assess the Project area's low-income and minority composition relative to that of its surroundings, specific demographic data were compared with census block group data for nearby communities and for the state (U.S. Census Bureau 2000). Relevant demographic characteristics for Arizona, Navajo County, Census Tract 9602 -Block Group 1, and Census Tract 9609 –Block Group 3 are shown in Table 3.18-1.

Table 3.18-1
Summary of Environmental Justice Populations

Area	Population	Minority (%)	Hispanic or Latin (%)	African American (%)	Asian (%)	American Indian (%)	Pacific Islander (%)	Other (%)	Two or More Races (%)	Age 60 or Older (%)	With Disability (%)	Single Female Heads of Household with Child (%)	Households Below Median Poverty Level in 1999 (%)
Arizona	5,130,632	37	25	3	2	5	0	0	2	17	19	11	12
Navajo County	97,470	57	8	1	0	47	0	0	1	14	22	17	26
Census Tract 9602 – Block Group 1	1,457	52	28	8	0	15	0	0	1	13	16	22	22
Census Tract 9609 – Block Group 3	1,243	18	10	0	0	6	0	0	2	18	16	3	10

Source: 2000 U.S. Census
Note: Shaded cells denote characteristics where block group percentage is more than 30 percent different than that of the corresponding county percentage. The normal threshold for triggering environmental justice concerns is a 50 percent difference.

3.18.1 Impacts of the Proposed Action

Socioeconomics

Construction and operation of the Proposed Action are anticipated to bring employment opportunities to the area. Initially, the construction of the Proposed Action could generate approximately 200 positions that are 9- to 12-month in duration. Subsequently, approximately 5–10 permanent full-time positions would be needed for operation and maintenance of the facility.

Given the Proposed Action's location, it is reasonable to assume that people employed by the facility may live in either Holbrook or Snowflake. If positions would be filled by people not living in the immediate area, there would be a minor increase in short-term housing accommodations and the need for goods and services.

The City of Holbrook has 1,626 owner-occupied, 517 renter-occupied, and 280 vacant housing units; and the median home value is $64,800 (US Census 2000). Holbrook Unified School District serves the community with two elementary schools, a junior high, and a high school. The city has its own police and fire departments. The closest hospital is Winslow Memorial Hospital in Winslow.

The City of Snowflake has 1,312 owner-occupied, 266 renter-occupied, and 224 vacant housing units, and the median home value is $92,500 (US Census 2000). Snowflake Unified School District serves the community with one each of primary, intermediate and high schools. The city has its own police and fire departments. The closest hospital is Navapache Hospital in Show Low.

Given this information, the impact of the construction on the infrastructure and services of the two cities would be minimal.

Increased employment and subsequent consumer spending would result in direct tax impact, including state and federal income taxes, state sales tax, property taxes paid by IBR, and both federal and state corporate income taxes paid on taxable revenues of the Proposed Action. Taxes paid by landowners on royalty income would also contribute to local, state, and federal tax revenues.

Property taxes from the project would equate to more than $18 million over the life of the Project and would support schools, public health, fire, library, and other necessary services in a county where in 1999 the per capita income was $11,609, more than 40 percent lower than the state average of $20,275.

Local spending during construction could reach approximately $10 million, and local spending during operations could reach as high as $900,000 per year (based on National Renewable

Energy Lab's JEDI model, developed to assess the economic development effects of constructing and operating wind plants).

Overall, construction and operation of the Proposed Action would cause a minor increase in regional employment: a temporary increase in employment of 6 percent and a permanent increase of approximately 0.3 percent within the municipalities of Holbrook and Snowflake.

The JEDI program offers estimates of Navajo County's "local share" in the construction of wind projects. "Local share" is defined as the percentage of expenditures spent in the state or local region where the wind energy project is constructed (Williams et al, 2007). During the construction phase, at least 25 percent of the money spent on construction and at least 40 percent of the labor costs will stay in the County. Conversely, none of the equipment costs (such as turbines, blades, and towers) will be spent in the County. During the annual operating and maintenance phase, at least 60 percent of the money spent on personnel is estimated to be spent within Navajo County. In terms of materials and services, at least 50 percent is estimated to be spent on vehicles and 100 percent on fees, permits, and licenses.

Despite the potential for minor land use conflicts that could result in economic impacts on ranchers or claim holders (as shown in Section 3.19), these would not likely result in any substantial negative economic impact on the region.

Concerns have been raised as part of the scoping process for this EA over the potential for negative impacts on property values of adjacent parcels. A 2003 study of post-1998 wind farms in the United States examined data on property sales in the vicinity of wind projects and determined whether and the extent to which the presence of a wind project had an influence on property values for properties that were sold. The results of the study indicated that there is no empirical support for the claim that wind development harms property values (REPP 2003). In fact, the study indicated that for the great majority of wind projects, the property values actually rose more quickly in the view shed than they did in the comparable community. Moreover, values increased faster in the view shed after the projects came on-line than they did before. Finally, after projects came on-line, values increased faster in the view shed than they did in the comparable community. Similarly, a nation-wide survey of tax assessors in areas with wind power projects found no evidence supporting the claim that views of wind farms decrease property values (ECONorthwest 2002). One of the likely reasons that wind turbines do not diminish property values is that not all people agree that views of wind turbine are undesirable. As reported in interviews of tax assessors, some residents find views of wind turbines attractive. Given the results of these studies, the Proposed Action would not be expected to adversely affect property values.

Environmental Justice

Population in Block Group 1 was 1,457 according to the 2000 Census, with population of Block Group 2 being 1,243. Both block groups have lower percentages of minority populations than

does Navajo County as a whole. Approximately 22 percent of the households in Block Group 1 and 10 percent in Block Group 2 are, by this definition, in poverty, compared with 26 percent for the county. No occupied residences would be directly affected by the proposed facility; no residents would be displaced.

While the county and the block groups do vary when comparing demographic characteristics, the block groups' differences are generally within 5–10 percent of the corresponding percentage for the county. Thus, the block group populations are relatively consistent with those of the county as a whole. Further, the actual people represented in the block groups do not reside within the Project area. Based on the absence of environmental justice populations, the development of a wind power generating facility would not result in a disproportionate impact on any low-income or minority populations. Therefore, there are no environmental justice concerns for the Proposed Action.

3.18.2 Impacts of the No Action Alternative

Under the No Action Alternative, the Proposed Action would not be built. Economic benefits associated with increased employment, multiplier effects from consumer spending, and taxes for local, state, and federal governments would not be realized. No environmental justice impacts would be associated with the choice of the No Action Alternative as the selected alternative.

3.18.3 Mitigation Measures for Environmental Justice (Social Economics) Impacts

Because no adverse impacts are anticipated, no socioeconomic or environmental justice mitigation measures are necessary or proposed.

3.19 PUBLIC SERVICES

The Project area is located in a very lightly populated, rural area in east central Arizona. An established transportation and utility network provides access and necessary services to light industry, small cities, and homesteads existing near the Project area. The closest towns are Holbrook and Snowflake, located more than 5 miles from the Project boundaries.

The Apache Railway (Abitibi International) runs north and south through the eastern portion of the Project area (see Figure 2-1). No interstate or U.S. highways are in the Project area. State Highway 377 runs north to south outside the western edge of the Project area, and State Highway 77 runs north to south outside the eastern edge of the Project area. For purposes of comparison, the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day, or Annual Average Daily Traffic (AADT). The 2005 AADT on the nearby segments of State Highways 77 and 377 was 3,200 and 1,700 vehicles per day, respectively (ADOT, 2003 to 2005). Traffic on the gravel and dirt two-track roads throughout the Project area is extremely light and primarily limited to traffic associated with grazing or livestock operations in the area.

The primary access road to the Phase I Project area is a gravel road that follows an existing transmission line that heads due south from State Highway 377 in Section 27, Township 15N, Range 19E (see Figure 2-2). Although there are several existing gravel or dirt roads off of State Highway 77, a specific road to access the subsequent phases portion of the Project area has not yet been identified. All of the potential roads off of State Highway 377 or 77 are non-paved and cross private lands. While current private landowners would continue to maintain access to their properties, existing or new gates would be used to prevent the general public from accessing the Project area.

Navajo County has been delegated the authority to administer conventional septic systems and some alternative septic systems within the non-reservation portions of the county. The county administers the Aquifer Protection Rules as issued by the Arizona Department of Environmental Quality and augmented by local protocols, procedures, and ordinances.

APS provides electrical service to the area. Near the Project area, APS owns the Chanarambie Substation. A 69 kV Cholla-Zeniff-Show Low transmission line runs through the western portion of the Project area, and a 69 kV Cholla-Snowflake-Show Low transmission line runs near the eastern portion of the Project area, both owned by APS.

Telephone service is provided by Qwest and other local telephone companies to the homes in the area.

3.19.1 Impacts of the Proposed Action

The Proposed Action is expected to have a minimal effect on the existing infrastructure. The following is a brief description of the impacts that may occur during the construction and operation of the Proposed Action.

- Electrical Service: Construction of Phase I of the Proposed Action would include up to 30 2.1 MW wind turbines, a pad-mounted transformer at the base of each turbine, a Project substation, an underground and aboveground electrical collection system, including an occasional aboveground junction box that would deliver power to the Project substation.
- Roads: Constructing Phase I of the Proposed Action would require approximately 12 miles of newly-constructed gravel access roads, and widening approximately 2 miles of existing gravel roads in the Project area. Subsequent phases would likely involve construction of up to 50 to 99 miles of access roads. In addition, during operation of the Proposed Action, the access roads would be used by operation and maintenance crews while inspecting and servicing the wind turbines. The access roads would be between towers. The roads would be approximately 16 feet wide and low profile to allow cross travel by landowners. Landowners would be coordinated with to locate these access roads to minimize land use disruptions. Construction traffic would use the existing roadway system to access the Project area and deliver construction materials and personnel.

During peak construction, it is anticipated that there would be an additional 25-35 vehicle trips per day to area roadways. Since the current traffic levels on the roadways in the Project area are well below roadway capacities, construction traffic would be perceptible but similar to seasonal variations. Construction is not anticipated to result in adverse traffic impacts. Operation and maintenance activities would not noticeably increase traffic in the Project area. Additionally, an access road siting and transportation management plan was prepared, incorporating the guidelines laid out in the BLM 2005 ROD to minimize impacts on traffic (BLM, 2005) IBR submitted this plan to the BLM as part of its Plan of Development.

- Railroads: The Proposed Action would not affect the use of the Apache Railway.
- Water Supply: Construction and operation of the Proposed Action would not significantly impact area water supplies. No installation or abandonment of any wells is anticipated for the Proposed Action. However, in the event wells are abandoned, they would be capped as required by Arizona regulations. The Proposed Action would not require the appropriation of surface water or permanent dewatering. Temporary dewatering may be required during construction for specific turbine foundations and/or electrical collector line trenches. A permanent water supply well would be necessary for the O&M facility. Water usage during the operating period would be similar to household volumes of less then five gallons per minute. Water needed for Project dust control, the concrete batch plant, or other construction activities would be obtained from an existing onsite well in cooperation with a participating landowner. IBR estimates that between 8,000 and 20,000 gallons of water would be needed for construction of each turbine.
- Telephone: Construction and operation of the Proposed Action would not impact the telephone service in the Project area. To the extent Proposed Action facilities cross or otherwise affect existing telephone lines or equipment, IBR would enter into agreements with service providers to avoid interference with their facilities.
- Federal Communication Commission Registered Towers: In March 2008, IBR contracted Comsearch to conduct a microwave beam path analysis of the Project area (Comsearch 2008). Based on the results of this analysis, IBR has revised the proposed locations of several wind turbines originally sited in the northwest ¼ of Section 3, Township 14N, Range 19E to avoid interfering with existing microwave beam paths. IBR would not operate the wind farm in a way that causes microwave, radio, telephone, or navigation interference contrary to FCC regulations or other law. In the event the wind farm or its operation causes such interference, IBR would take the measures necessary to correct the problem.
- Because the Project would not lead to an over-commitment of, degradation of, or interference with existing public services, the Project would not result in any significant impacts.

3.19.2 Impacts of the No Action Alternative

Under the No Action Alternative, the Proposed Action would not be built and no changes would occur to existing public services.

3.19.3 Mitigation Measures for Public Services Impacts

Construction and operation of the Proposed Action would be in accordance with all associated federal and state permits and laws, as well as industry construction and operation standards. Due to the minor impacts expected on the existing infrastructure during construction and operation, extensive mitigation measures are not anticipated.

An access road siting and management plan was prepared, incorporating existing BLM standards regarding road design, construction, and maintenance such as those described in the Wind Energy PEIS and ROD (BLM 2005), BLM 9113 Manual (BLM and USFS 1985) and the *Surface Operating Standards for Oil and Gas Exploration and Development* (Fourth Edition 2006) (i.e., the Gold Book). The size and nature of wind turbine components and cranes would likely require some modifications to the Gold Book standards. IBR submitted the access road siting management plan to the BLM as part of its Plan of Development.

IBR developed a transportation plan, particularly for the transport of turbine components, main assembly cranes, and other large pieces of equipment. The plan incorporate the guidelines laid out in the Wind Energy PEIS and associated ROD (BLM, 2005). IBR submitted the transportation plan to the BLM as part of its Plan of Development. Transportation activities would be conducted so as to minimize impacts on the traffic flow. The plan considers specific object sizes, weights, and unique handling requirements and would evaluate alternative transportation approaches. The process to be used to comply with unique state requirements and to obtain all necessary permits would be clearly identified. A traffic management plan was prepared for the site access roads to ensure that no hazards would result from the increased truck traffic and traffic flow would not be adversely impacted. This plan incorporates measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary temporary changes in lane configuration. IBR submitted the traffic management plan to the BLM as part of its Plan of Development.

3.20 HUMAN HEALTH AND SAFETY

There are few existing risks to human health and safety in the Project area. There are only isolated residences in the vicinity of the Project area; the closest is approximately 3 miles north of the Phase I boundary. Fire is the primary existing health and safety risk, because much of the Project area is located within the Colorado Plateau Semi-Desert Province Ecoregion. The predominant activities that currently occur within the Project area include grazing and vehicular travel, and the Project area has a very low population densities. Evaluation of safety and health issues was limited to the Project area and specifically focused on the construction and maintenance activities associated with the Project.

There are no airports located within the vicinity of the Project area. The nearest airports are Holbrook Municipal Airport, located approximately 12 miles north of the Project area, and Taylor Town Municipal Airport located approximately 9 miles south of the Project area. Holbrook Municipal Airport has two paved runways 5,234 and 5,262 feet in length, and the Taylor Town Municipal airport has two paved runways 5,823 and 5,719 feet in length. Local air traffic may be present near the Project area. Additionally, there are military flight training paths in the vicinity of the Proposed Action.

3.20.1 Impacts of the Proposed Action

Air Traffic

The installation of wind turbine towers and overhead distribution lines would create a potential for collisions with low-flying aircraft. However, collection lines are expected to be underground or similar to existing overhead distribution lines that are located in the Project area. The turbines would be visible from a distance and lighted according to the 2007 revised FAA guidelines. The Proposed Action would have no significant impacts on air traffic in the region because there are no airports in the Project area and the wind and meteorological towers would have lighting to comply with FAA requirements. IBR has coordinated with the U.S. Air Force to confirm that the Proposed Action does not pose any conflicts with military training or operations in the area. Local airports and the military would be notified about the Project and new towers in the area to reduce any risk to aviation safety.

Other Safety Issues

The BLM's Wind Energy PEIS (BLM 2005) identifies public safety hazards during construction, operation, and maintenance of a wind energy development project. These hazards include risk associated with major construction sites, rare tower failures, human-caused fire, electric and magnetic field (EMF) exposure, electromagnetic interference (EMI), aviation safety interference, low frequency sound, and shadow flicker. The Wind Energy PEIS identifies planning and operating measures that have been successfully implemented in other wind farm projects to reduce or avoid public safety risks. As necessary, these measures would also be used to avoid or minimize safety issues associated with the Proposed Action. However, there are no residences or public gathering areas located in the Project area that would create potential human health or safety issues.

The Proposed Action would be designed to comply with all applicable local, state, federal National Environmental Services Center (NESC), BLM and industry standards regarding worker safety, strength of materials, and ROW widths. Construction crews would comply with local, state, federal NESC, BLM regulations, and IBR standards regarding installation of facilities and standard construction practices. This would include clear signage during all construction activities.

3.20.2 Impacts of the No Action Alternative

Under the No Action Alternative there would be no changes to existing human health and safety conditions.

3.20.3 Mitigation Measures for Human Health and Safety Impacts

A safety assessment would be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access, construction, safe work practices, security, heavy equipment transportation, traffic management, emergency procedures, and fire control.

To avoid and minimize potential impacts on human health and safety, IBR developed a health and safety program to protect both workers and the general public during construction, operation, and decommissioning of the Project. IBR submitted the health and safety plan to the BLM as part of its Plan of Development. Regarding occupational health and safety, the program would identify all applicable federal and state occupational safety standards; establish safe work practices for each task (e.g., requirements for personal protective equipment and safety harnesses; Occupational Safety and Health Administration (OSHA) standard practices for safe use of explosives and blasting agents; and measures for reducing occupational electric and magnetic fields exposures; establish fire safety evacuation procedures; and define safety performance standards (e.g., electrical system standards and lightning protection standards). The program would include a training program to identify hazard training requirements for workers for each task and establish procedures for providing required training to all workers. Documentation of training and mechanisms for reporting serious accidents to appropriate agencies would be established.

IBR would confer with Navajo County regarding increased traffic during Project construction, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern would be identified and addressed in a traffic management plan.

IBR also developed a fire management strategy to implement measures to minimize the potential for human-caused fires. IBR submitted the fire management plan to the BLM as part of its Plan of Development.

3.21 CUMULATIVE IMPACTS

Cumulative impacts may result when the environmental effects associated with a proposed project are superimposed on, or added to, either temporary or permanent impacts associated with past, present, or reasonably foreseeable future projects or activities. Although the individual impact of each separate project may be minor, the additive or synergistic effects of multiple projects or activities could be significant.

Existing environmental conditions in the vicinity of the Proposed Action reflect the changes brought about by long-term human occupancy and use of the Project area. Grazing practices;

vehicle travel along gravel and paved township, county and state roadways; railroad operation and use; operation of existing electric transmission facilities; and mining operations are the primary activities that have occurred and are presently occurring in the general vicinity of the Proposed Action. There is an operating pig farm and several associated water ponds in the eastern portion of the Project area and two pig quarantine facilities in the western portion of the Project area. Within the boundaries of Phase I of the Proposed Action, there are 4,500 acres of private land currently under lease for mineral rights; there are 7,040 acres of private land currently under lease for mineral rights in the eastern portion of the Proposed Action. Given these leases, the potential for future mining activities within the Project area exists although the degree to which specific mining projects are reasonably foreseeable remains questionable. It is noteworthy to consider that a review of BLM records shows no active federal mining claims within the Project area (see Section 3.2).

APS is currently proposing to build a 69/500-kV APS Second Knolls Substation near the eastern portion of the Project, as well as a new 69-kV transmission line. After Phase I of the Project is completed, existing transmission line infrastructure in the area has capacity for an additional 64 MW of wind energy. So of the 314 MW of wind energy generated by subsequent phases of the Project, APS would have to complete the upgrades to its system planned for 2009 to accommodate anything beyond 64 MW (i.e., electric transmission capacity for the remaining 250 MW of wind energy would require the APS upgrades).

Future activities and developments on BLM-administered lands in the Project area, potentially including construction of an electric transmission line, would be expected to implement design BMPs to minimize impacts on environmental resources.

3.21.1 Cumulative Impacts on Geological Resources

Impacts on geological resources from the Proposed Action are not expected to be significant, given the following: 1) appropriate design that incorporates results of subsurface characterization; 2) implementation of BMPs, including appropriate strategies for selection of final locations of Project facilities, utilization of foundation types best suited to the site subsurface conditions, inclusion of drainage control features, and proper construction techniques. Nonetheless, while it appears unlikely, the occurrence of existing developments and/or future development could contribute to a cumulative increase in overall impacts on geologic resources in the area.

3.21.2 Cumulative Impacts on Paleontological Resources

The effects of the Proposed Action, in combination with other surface-disturbing activities such as transmission projects in the Project area, would not be expected to adversely affect paleontological resources.

3.21.3 Cumulative Impacts on Soils

With implementation of the BMPs described in the SWPPP prepared in compliance with the AZPDES permits, soil erosion would be prevented and contained. The transmission projects in the area would have similar construction methodology as the Proposed Action and would not be expected to contribute to erosion. Any proposed mining operations would also be expected to use appropriate BMPs to control erosion. Adherence to AZPDES permits would require adequate design, grading, and use of BMPs to ensure that the soil resources are not affected by these projects. The wide spacing of the wind turbines and transmission line poles would result in relatively minimal impacts on soils. Similarly, proper range management would avoid significant impacts on soils that could result from overgrazing. The Proposed Action in combination with reasonably foreseeable projects and activities therefore would not result in erosion or siltation that would lead to measurable air or water degradation and would not result in a loss of topsoil that would cause a measurable decline in agricultural or habitat uses.

3.21.4 Cumulative Impacts on Wastes, Hazardous or Solid

With the implementation of the hazardous materials management plan, waste management plan, and SPCC Plan, the Proposed Action would avoid significant environmental impacts associated with hazardous or solid wastes. Similarly, other proposed or reasonably foreseeable future projects or activities would be required to implement similar plans, thereby reducing the potential for cumulative impacts.

3.21.5 Cumulative Impacts on Water Quality and Quantity

The effects of the Proposed Action, in combination with other projects in the area, would not be expected to adversely affect water quality or quantity. The transmission projects in the area would result in a very small increase in impermeable surfaces and therefore would not contribute to indirect impacts due to increased runoff. Additionally, direct impacts would be avoided by routing around or completely spanning streams. Spanning streams would also avoid disturbing near stream vegetation, thus minimizing the potential for water quality impacts due to increase sedimentation. To the extent that future mining development occurs in the Project area, proper design and implementation of BMPs could minimize cumulative surface water and groundwater impacts.

Water quality in Silver Creek (located just east of the Project area) has been altered by increased sedimentation resulting from an extensive wildfire in its upper watershed. Therefore, further contributions of sediment from the Proposed Action or other planned projects in the area would be of concern. However, the effects of the Proposed Action, in combination with other projects or activities in the area, would not be expected to adversely affect sedimentation rates into Silver Creek, if appropriate erosion control measures are implemented and maintained (e.g., those described in the SWPPP). The transmission projects in the area would result in a very small increase in impermeable surfaces and therefore would not contribute to indirect impacts due to increased runoff.

3.21.6 Cumulative Impacts on Wetlands and Riparian Zones

The effects of the Proposed Action, in combination with other mining and transmission projects in the Project area, would not be expected to adversely affect wetland or xeroriparian resources. The transmission projects and mining operations in the area would result in a relatively small increase in impermeable surfaces and therefore would not contribute to indirect impacts due to increased runoff. Additionally, most impacts on xeroriparian zones would be avoidable by routing and would be minimized when unavoidable by spanning the xeroriparian zone.

3.21.7 Cumulative Impacts on Floodplains

The effects of the Proposed Action, in combination with other mining and energy projects in the Project area, would not be expected to affect area floodplains. The transmission projects in the area would have similar construction methodology as the Proposed Action, would result in a very small increase in impermeable surfaces, and would not be expected to contribute to impacts on floodplain elevations.

3.21.8 Cumulative Impacts on Vegetation

The Proposed Action would result in permanent impacts on vegetation communities in the Project area. The extent of these impacts would largely depend on soil moisture levels during the growing seasons following construction. It is conceivable that heavy grazing in areas disturbed by Project construction could slow the rate of revegetation. Regardless, IBR would confer with range restoration/conservation specialists with the BLM and NRCS to determine the need to develop and implement a remedial revegetation plan if post-construction monitoring suggests there are problems in revegetating areas disturbed by construction. Although transmission, mining, and other development projects in the vicinity could result in small losses of vegetation immediately adjacent to the footprint of new facilities, these losses are not expected to contribute to a measurable change of the vegetative landscape in the Project area.

3.21.9 Cumulative Impacts on Invasive and Nonnative Species

The effects of the Proposed Action, in combination with other projects in the area, would not be expected to adversely affect the presence of invasive or nonnative species in the Project area. Although transmission, mining and other development projects in the Project area could result in introduction of noxious species to previously uncontaminated areas. However, it is expected that other projects in the area would use similar mitigation measures as those used for the Proposed Action to prevent the spread of invasive and nonnative species.

3.21.10 Cumulative Impacts on Wildlife

The effects on wildlife species from the Proposed Action, in combination with the other planned projects in the region would not be expected to result in significant impacts on any birds, bats, other mammals, reptiles, or amphibians.

Temporary construction impacts on wildlife species as a result of the planned transmission projects would be expected to be similar to those of the Proposed Action; namely, displacement would be short-term and localized, and individuals could return to the area upon completion of

construction. Although there would be some mortality of small animals, rodents, and reptiles during construction of the Proposed Action, the level of impact would not significantly impact populations, even when considered in context of other ongoing or reasonably foreseeable future projects or activities.

Concerns have been expressed over cumulative impacts on wildlife, particularly migratory birds, from the development of wind farms and associated transmission facilities in the United States. Past, present, and anticipated developments with aerial features, such as transmission lines, could reasonably cause collisions to increase over current conditions. Careful siting is important to avoid major migration corridors. No such corridors have been identified within the Project area (WEST 2007). The Proposed Action and future projects in the area would be expected to conform to Avian Power Line Interaction Committee guidelines to ensure that proper designs are incorporated into electrical generation, transmission, and distribution development, thus minimizing collision and electrocution risks. An in depth review of avian mortalities associated with collisions with human structures suggests that about 0.01 to 0.02 percent are associated with wind turbines (Erickson et al. 2001). This equates to 1 to 2 out of every 10,000 bird deaths. Even if wind energy facilities were to become quite numerous, they would likely cause no more than a few percent of all collision deaths related to human structures (roads, powerlines, communication towers, buildings and windows). Relatively similar numbers of bats would likely be killed by other human structures compared to wind turbines; however, detailed and comparative studies on bat mortalities from various sources have not been completed.

Increased development and roadway construction in the region has led to habitat loss and fragmentation for pronghorn antelope. Although there would be approximately up to 288 acres of habitat (primarily desert grassland) permanently removed as part of the Proposed Action, the loss is spread out over a 75-square-mile area and would minimally affect existing wildlife populations. Additionally, the Project would not increase public access to the Project area. The proposed transmission projects in the Project area and Proposed Action would not involve constructing long fences or other linear barriers to pronghorn movement; herds would be able to move beneath transmission lines and over improved access roads without impediment.

Given the extensive availability of similar habitats throughout the Colorado Plateau Ecoregion and the relatively minor Project impacts on populations of reptiles and amphibians associated with the Project, cumulative impacts associated with the Proposed Action, when added to other past, present, and reasonably foreseeable future actions occurring in the region, would likely be insignificant.

3.21.11 Cumulative Impacts on Threatened and Endangered Species

The effects on special status species from the Proposed Action, in combination with the other planned projects in the region, would not be expected to result in significant impacts on any species.

Special Status Plants

Ongoing grazing activities, property development, mining activities, transmission projects, and/or collection could all potentially contribute to impacts on special status plants in the Project area. Compliance with Arizona's Native Plant Law as well as implementation of appropriate avoidance and mitigation measures would protect these species from significant cumulative impacts.

Gunnison's Prairie Dog

Prairie dog populations have historically been severely impacted by control programs, widespread conversion of habitat, and disease. The effects of the Proposed Action on prairie dogs, in combination with the other planned projects in the region would not be expected to result in significant impacts on prairie dogs.

Little Colorado Spinedace

A wildfire in the upper reaches of the Silver Creek watershed during 2002 led to increased sediment loading into Silver Creek in subsequent monsoon seasons. The resulting changes in the stream geomorphology have changed the floodplain of the Silver Creek (the City of Taylor has flooded in recent years), leading to concerns over the Little Colorado spinedace population. Therefore, further contributions of sediment from the Proposed Action or other planned projects in the area would be of concern. However, if BMPs are properly implemented and maintained, the effects of the Proposed Action, in combination with other development activities in the Project area, would not be expected to adversely affect water quality in Silver Creek. The transmission and mining projects in the area would likely result in a relatively small increase in impermeable surfaces and therefore would not be expected to contribute to indirect impacts due to increased runoff.

3.21.12 Cumulative Impacts on Land Use

Construction and operation of the Proposed Action may affect the character of the Project area and reduce the likelihood of residential development. The Navajo County Comprehensive Plan presents the Project area as a Rural Edge character area, designed to provide low-density housing. In addition, the zoning ordinance for A-General and Rural-20 allows uses that are more compatible with urban settlements, not with a major commercial utility facility. While grazing and mineral exploration may continue near term in the Project area, lack of residential, commercial, or municipal development may require the area to be rezoned and/or re-characterized to allow other compatible uses. Because current private landowners would continue to maintain access to their properties and existing or new gates would be used to prevent the general public from accessing the Project area, there would be minimal changes to hunting, recreational uses, and public access due to construction and operation of the Project. In combination with other development activities in the Project area, the Project would not be expected to contribute to any significant cumulative impacts on hunting, recreational uses, and public access issues.

3.21.13 Cumulative Impacts on Visual Resources

The potential for cumulative effects on the visual landscape is dependent on future above-ground structures or facilities. Future transmission line projects could cumulatively contribute to impacts on the visual setting.

3.21.14 Cumulative Impacts on Cultural Resources

The effects of the Proposed Action, in combination with other projects and activities in the Project area, would not be expected to adversely affect sensitive cultural resources. Most activities in the Project area with the potential to impact cultural resources would require a federal action and thus require consultation with the Arizona SHPO and appropriate Native American tribes.

3.21.15 Cumulative Impacts on Air Quality

Other planned transmission projects in the area would have temporary, isolated construction-related air quality effects. There is a greater potential for air quality effects from mining activity, where compressors and generators might require air quality permits. Federal and state permits would regulate the amount of diesel engine emissions, natural gas emissions, and other criteria pollutant emissions from any proposed mining activities. These regulations may reduce air emissions from any mining exploration in the Project area. Nevertheless, the Project would not contribute to cumulative impacts on regional air quality.

3.21.16 Cumulative Impacts on Noise

The primary issue of concern would be the additive noise associated with future mining and energy development and infrastructure in the area, particularly the proposed 69/500-kV APS Second Knolls Substation and ancillary facilities associated with this and other projects. The characteristics of noise, however, dictate that noise is reduced with distance. Due to the extremely scattered nature of the Proposed Action in relation to existing and reasonably foreseeable activities that might contribute cumulatively to increased noise in the Project area, it is unlikely that sensitive receptors (e.g., residences) would experience an increase in noise levels above current conditions.

3.21.17 Cumulative Impacts on Socioeconomics/Environmental Justice

By providing new wind-generated energy, the Proposed Action would contribute to the local economy through easement dollars and taxes generated from wind energy facility construction and operation. The establishment of this area as a new producer of alternative energy sources, primarily wind, may also spur the development of related infrastructure in the area, including the proposed transmission grid improvements, in turn contributing to economic growth in the region.

3.21.18 Cumulative Impacts on Public Services

The mitigation measures undertaken to avoid impacts on water supply and communication providers would keep the Proposed Action from contributing to cumulative impacts on public services. Future mining operations could add traffic to area roads, but the associated trips would not be expected to significantly reduce the service levels of the roads. It is likely that any new

mining operations would develop their own access road siting and transportation management plans, further minimizing the potential for impacts. The Proposed Action would not result in a long-term increase in traffic to the Project area and therefore would not contribute to cumulative impacts on traffic patterns in the region.

3.21.19 Cumulative Impacts on Human Health and Safety

The Proposed Action's contribution to cumulative impacts on health and safety would be low with the implementation of various plans and procedures. Transmission line construction and mining exploration or development could similarly increase the risk cumulatively, but with proper safeguards and procedures, these risks should remain small. For example, the application of SPCC Plans, hazardous materials management plans, and traffic management plans would reduce the cumulative risk to human health and safety.

3.22 NATIONAL ENERGY POLICY

The Proposed Action would produce up to 378 MW of energy that would be transmitted into the existing grid. An interconnection agreement between IBR and APS is currently in progress. The Interconnection Agreement would guarantee that interconnection capacity would be available for the Proposed Action. Additionally, the existing and proposed transmission lines in the Project area would provide interconnect capacity for the energy produced by the Proposed Action. Therefore, the Proposed Action would not have an adverse impact on energy development, production, supply, and/or distribution, and a "Statement of Adverse Energy Impact" does not need to be prepared.

3.23 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible and irretrievable impact is defined as a permanent reduction or loss of a resource that once lost cannot be regained. Most energy development projects, such as gas, oil, or coal fire plants, result in an irreversible and irretrievable commitment of the power-generating resources (fuel). Wind is a renewable resource that would not be depleted or altered by the Proposed Action and could offset the need to consume fossil fuels.

The loss of productivity (i.e., forage, wildlife habitat) from lands devoted to Project facilities would be an irreversible and irretrievable commitment during the time that those lands are out of production and until they are successfully revegetated. Most of the land would be returned to production after restoration and revegetation; however, the vegetation community may take several growing seasons to fully recover given the arid nature of the landscape.

Inadvertent or accidental destruction of paleontologic or cultural resources during construction would be an irreversible and irretrievable loss, but it is not likely to be a significant impact since archaeological and paleontologic monitoring and data recovery activities would be conducted as deemed appropriate by the BLM.

There would be an irreversible and irretrievable commitment of the energy used during construction, drilling, production, and restoration associated with the proposed project. Inert underground electrical cables and underground concrete turbine pads located at least 3 feet below the ground surface would be permanent and left in place after Project decommissioning, provided landowner permission is obtained. They cannot be recovered due to practical or economic considerations, so they would be irreversibly and irretrievably committed.

3.24 COMPLIANCE AND MONITORING

An on-site compliance manager (provided by IBR) would require the construction contractors to designate a Field Contact Representative (FCR) to oversee their compliance during construction. The FCR is responsible for overseeing compliance with protective measures associated with the AZPDES permits, SWPPP, SPCC Plan, traffic management plan, waste and hazardous materials management plan, control of noxious and invasive plant species plan, and other coordination in accordance with the county and other regulatory agencies.

Additionally, a qualified biologist would provide environmental training and monitoring during construction. The course would provide information on the sensitive species present on-site, exclusion flagging, permit requirements, and other environmental issues. The training would also cover proper protocol for responding to dead or injured wildlife. Construction and operations personnel would be required to report any injured or dead wildlife detected while on the site to the biological monitor during construction or appropriate on-site manager during operations. All construction site personnel would be required to attend the environmental training in conjunction with hazard and safety training prior to working on-site.

The qualified biologist would visit the site before site development to sign sensitive resource areas as well as periodically during construction in order to flag sensitive resource areas. If heavy construction is scheduled to occur in close proximity to active sensitive raptor nests, a qualified biologist(s) would monitor the nests to observe nest site abandonment or a reduction in productivity.

CHAPTER 4 CONSULTATION AND COORDINATION

4.1 INTRODUCTION

In developing this EA, the BLM consulted and coordinated with a variety of Project stakeholders. A scoping process was developed for the Project to ensure that interested parties, including federal, state, and local agencies, organizations, interested persons, landowners and the general public were contacted, consulted and given an adequate opportunity to be involved in the process. This included specific stakeholder consultations and coordination consistent with NEPA, NHPA, American Indian Religious Freedom Act, Endangered Species Act, and other applicable regulatory requirements.

4.2 NATIONAL ENVIRONMENTAL POLICY ACT CONSULTATION AND COORDINATION

Consistent with NEPA, the BLM conducted a scoping process and invited comments on the content and issues that should be addressed in the environmental analysis and review. A news release and Project map were mailed or emailed to more than 662 Project stakeholders and interested parties on May 15, 2007. Stakeholders and interested parties included federal, state, and local officials; agency representatives; conservation organizations; Native American tribes; local libraries and newspapers; and landowners in the general vicinity of the Project. Additionally, a formal scoping letter was sent to 99 federal, state, and local agencies and tribal representatives.

Also as part of the NEPA process, the BLM held a public scoping meeting in Snowflake on June 12, 2007. Presentations were made by BLM and IBR about the project and the environmental review process. About 30 individuals attended this meeting. In addition, comment forms were made available for the public to submit written comments at and following the meeting. Verbal comments received during the meeting were recorded and incorporated into the issues and concerns that are the focus of this EA.

The NEPA scoping period was 45 days, lasting from May 15 to June 29, 2007. Comments received were the basis for the issues and concerns that are the focus of the environmental review in this EA. Eight written comments were received. Issues raised during the scoping process included:

General

- Other authorizations, permits, reviews, and approvals required for the Project.

Cultural Resources

- Potential impacts on tribally/culturally sensitive properties and artifacts.

Land Use

- Potential impacts on existing land uses.

Biological Resources

- Potential impacts on wildlife and birds.

Socioeconomics

- Potential impacts on property values.

Visual Resources

- Potential impacts on visual/landscape aesthetic.

Human Health and Safety

- Potential risks/impacts on civilian and military flight routes and airports.
- Potential risks to public safety.

The general comment about other permits and authorizations is addressed in Section 1.4 of this chapter. The remaining issues are addressed in Chapter 3.

Stakeholders will have an additional opportunity to provide input on the Project by commenting on this EA. Public review of the EA will be completed following a 30-day comment period. If no significant impacts are identified, the BLM will issue a Finding of No Significant Impact (FONSI) for the proposed Project.

4.3 NATIONAL HISTORIC PRESERVATION ACT CONSULTATIONS

To comply with Section 106 of the NHPA, BLM has initiated consultations with the SHPO. The BLM, the lead federal agency ultimately responsible for compliance with NHPA, has concluded that the proposed undertaking would have "no adverse effect" on historic properties eligible for listing on the NRHP. This conclusion is based on IBR's commitment to complete necessary cultural resource surveys prior to construction and, if necessary, to reconfigure Project facilities to avoid historic properties eligible for listing on the NRHP. On September 5, 2007, the BLM submitted a letter to the SHPO regarding the Project. In its response dated October 23, 2007, the SHPO concurred with the results of the Class III cultural surveys that were completed in 2007 and supported the plan to avoid Register-eligible sites through Project design.

In compliance with NEPA, NHPA, and American Indian Religious Freedom Act, 22 tribes were consulted regarding the Project. The tribes that BLM consulted include:

- Gila River Indian Community
- Ak-Chin Indian Community
- San Carlos Apache Nation
- Tohono O'odham Nation
- Hopi Tribe
- Colorado River Indian Tribes
- Fort McDowell Yavapai Nation
- Fort Mojave Indian Tribe
- Fort Yuma-Quechan Tribe
- Havasupai Tribe
- Hualapai Tribe
- Kaibab-Paiute Tribe
- Navajo Nation
- Pascua Yaqui Tribe
- San Carlos Apache Tribe
- San Juan Southern Paiute Tribe
- Tonto Apache Tribe
- Cocopah Tribe
- Pueblo of Zuni
- Yavapai-Prescott Indian Tribe
- White Mountain Apache Tribe
- Salt River Pima-Maricopa Indian Community

In formal consultation letters mailed on August 10, 2007, the tribes were asked to identify any properties of traditional, religious, or cultural importance which may be affected by the proposed project, and to identify any traditional or religious leaders who may have information about places of cultural significance. Furthermore, tribes were invited to comment on any environmental, cultural, or other issues relating to the project proposal which may be of concern to their communities.

After the 30-day comment period ended on September 10, 2007, the BLM followed-up with each tribe via phone since few written comments were received from the tribes. For each tribe, the Cultural Resources Division or Chairperson's Office was contacted to ensure no issues or concerns were missed.

In summary, the BLM did not receive any negative comments or concerns from the tribes regarding the proposed action. No tribes objected to the Project. In fact, the Hualapai Tribe responded that they "support alternative energy projects, specifically wind energy" and that they have no additional comments on this project. The remaining tribes stated that they had no concerns or comments regarding the proposed project.

It is anticipated that the proposed Project will have "no effect" on Native American Religious Concerns.

4.4 ENDANGERED SPECIES ACT CONSULTATIONS

To comply with Section 7 of the Endangered Species Act (1973), BLM and IBR initiated consultations with the USFWS. The BLM, the lead federal agency ultimately responsible for compliance with Endangered Species Act, has concluded that the Project would have "no effect" or would "not likely adversely affect" federally endangered or threatened species or their designated critical habitats. On October 23, 2007, the BLM submitted a Biological Assessment to the USFWS with a request for written concurrence with its determinations of effect; in a letter dated November 16, 2007, the USFWS concurred with the BLM's determinations of effect of the Project.

4.5 OTHER BIOLOGICAL RESOURCE COORDINATION

Meetings and correspondence have occurred with BLM, USFWS, and AGFD staff regarding biological resources in the Project area. This included coordinating on the survey protocol used to design the ecological baseline study to assess the presence of birds and bats in the Project area. Additionally, these agencies were also contacted to discuss the results of the ecological baseline study and other biological issues of concern.

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