SECTION D: LOCATION

6. Mitigative Measures

This section provides a description of the environmental conditions, which exist at the Development site. Consistent with the various agencies regulations, various exclusion and avoidance criteria have been taken into account in the section of the project area from a large study area. To support this siting process, surveys and studies of the Development site were undertaken to assess the presence or absence of the following:

- National and state parks, wildlife refuges, wilderness areas, monuments, historic sites, and districts and special designation river ways and trails.
- State wildlife management, scientific and natural areas.
- Nature conservancy preserves.
- County and municipal parks
- Registered historic sites and districts
- Prime farmlands
- Wetlands
- Avian nesting areas and migration routes
- Streams
- Residences

Demographics/Homes

Site Description of Resources

The proposed Development is located within a lightly populated rural area in southeastern North Dakota. The Development site is located in Logan County, North Dakota. Information on demographics and housing for this section was taken from the U. S. Census Bureau. The population in Logan County has decreased by an estimate 2.0 percent since 2000. There is indication of no new residential construction occurring in the site area. The estimated 2004 population is 2099.

Impacts

Demographics and residences are anticipated to be affected by the proposed construction and operation of the wind power plant.

Mitigative Measures

Just Wind purposes to use the required setbacks established by the Logan County Zoning Ordinance from occupied homesteads, public roads, and adjacent property of landowners not involved in the Project.

Occupancy Status of Structures

There are approximately forty-five (45) homesteads within the Development site.

Noise

Noise consultants have recommended a maximum noise threshold of 45dBA at occupied homes. To facilitate planning for this guideline, the manufacturer has created simulations verified by independent testing of noise emissions from the 2.3 MW turbine. Results indicate source noise from turbine at hub height to be 104dB. Uncertainty is +/-2dB for results. The distances of 1,000 feet noise will meet the industry standard of 45 dBA at all occupied homes in the project site.

Recreation Resources

Recreation resources were obtained from the North Dakota Parks and Recreation Services, the North Dakota Game and Fish Department, and the U. S. Fish and Wildlife Service.

Description of Resources

Recreational opportunities in Logan County include hunting, fishing, snowmobile, and campgrounds.

Impacts

Visual impacts will be the most evident in the Development site area as well as no hunting near the turbine locations.

Public Health and Safety

Air Traffic, Electromagnetic Fields, Security, and Traffic

Air Traffic. There is one local airport located just south of the Development site. The typical use of this airport is for crop dusting, approximately twice a year. However, the vast majority of the current land use is agricultural, which may require periodic overhead spraying of crop dusting. Crop dusting is typically carried out during the day by highly maneuverable airplanes or helicopters. The installation of the wind turbines in active cropland will create a potential for collisions with crop-dusting aircraft. Due to health, safely and insurance issues, crop dusting is STRONGLY DISCOURAGED, but if applied, should ONLY be done by Pilots that have experience in this type of applications in the Development Site area. One farmer in the Development site did use a crop dusting service. He will try a ground spraying application this next growing season. Just Wind will install safety shields or another type of indicator to the wires of met towers to make the wires more visible.

Site Conditions

Background noise levels in the Development site area are typical of those in rural settings, where decibel levels are commonly in the low to mid-30 decibels (dBA). These ratings are relatively low background levels and generally representative of the Project site. Higher levels exist near main roads and other areas of human activity. In addition, the windy conditions in this region tend to increase ambient noise levels compared to other rural areas.

Impact

The wind turbines will be sited so as to comply with or to exceed the existing noise standards established by the North Dakota Pollution Control Agency. The maximum noise levels for the Development, as measured at all occupied residences, will be no greater than 45 dBA with no discernible pure tones.

Mitigative Measures

Setbacks will be established where the wind turbines will be sited according to the Logan County Zoning Ordinance so as to create a setback or buffer to minimize noise.

Visual

Site Description

The Development site for the proposed Project is visually dominated by agricultural fields, farmsteads, fallow fields and large open vistas. The landscape can be classified as rural open space with gently rolling topography. Local vegetation in the area is predominantly pasture with varying crops of corn, sunflower, small grain and forage crops, creating a low uniform cover. Farmsteads are typically surrounded by a mix of deciduous and coniferous tress planted for windbreaks. In the swales, there is occasional riparian growth of native willows, cattails, sedges, and rushes.

The settlements in Logan County are residences and farm building (occupied and unoccupied) scattered along rural the rural township and county roads. These structures are focal points in the dominant open space character of the vicinity.

At close range the turbines will be visible from local county, township and state roads adjacent to the wind plant. All of these local two-lane roads carry limited amounts of traffic, of which most is local. In the general Development area there will be intermittent expansive views of the area.

Impact

The placement of up to 160 turbines with the potential for 210 will have some impact on the area's visual quality. However, visual effect is primarily based on a subjective human response. The wind power plant will most likely have a combination of effects on the visual quality/rural character of the area. From one perspective, the proposed Development site might be perceived as a visual intrusion on the natural aesthetic value of the landscape, characterized as tubular steel structures, standing on formerly undisturbed ridgelines.

On the other hand, wind plants have their own aesthetic quality, distinguishing them from other non-agricultural land uses. First, the wind plant does not generate much traffic or significantly increase day-to-day human activity in the area. Therefore, the Development site will retain the rural nature of the area. Second, although "industrial" in form and purposes, wind turbines are essentially "farming" the wind for energy. The proposed land use would not involve any ongoing use of non-renewable resources or emissions into the environment. Fossil fuels will not be refined, transported, or burned for the production of electricity. Emissions of toxic substances will not be produced by the wind plant. Although the turbines are "hi-tech" in appearance, they are compatible with the natural environment and rural area.

Mitigative Measures

The following are proposed mitigative measure:

- Wind turbines and turbine access roads will not be located in Nature Conservancy Land, State Wildlife Management Areas, or Scientific and Natural Areas. However, some turbine locations might be in native prairies. In accordance with state and federal guidelines.
- Turbines will not be located in biologically sensitive areas such as wetlands or relic prairies.
- Turbines will be illuminated according to FAA regulations.
- Existing roads will be used for construction and maintenance where possible. Road construction will be minimized.
- Access roads created for the wind power plant will be located on gentle grades to minimize visual cuts and fills.
- Temporarily disturbed areas will be reseeded to blend in with existing vegetation.
- Any local road damage will be repaired.

Public Service/Infrastructures

Description of Resources

The proposed Development is located in a lightly populated, rural area in southeast North Dakota. There is an established transportation and utility network, which provides access and necessary services to the light industry, small cities, homesteads, and farmsteads in the area.

Electrical Service. Electrical service in the area is shared by Montana Dakota Utilities and the local Rural Energy Co-ops.

Traffic Routing. The major traffic routes to and from the Development site include North Dakota State Highways 3 and 34. In addition, there are several county, township, and section line roads that provide access to the Development site, including two-lane paved and gravel roads and minimum maintenance roads. In the agricultural areas, many landowners use single-lane farm roads and driveways on their property.

Water Supply. The proposed wind power plant is not connected to a municipal water supply system. Wells provide the water needed for human consumption, farming, commercial and industrial use, except in the local towns.

Sanitary Sewer. Sanitary sewer systems are only available to the residences commercial, and industrial operations located within the cities near the proposed Development site. The occupants residing within the Development site have individual septic systems to handle their sanitary wastes. This will be the same for the Hydrogen Production Facility and the Renewable Energy Center.

Roads. Construction of the proposed wind power plant will require some local unimproved roads to be upgraded and the addition of new access roads will be routed along the wind turbine strings, fence lines, and field edges to minimize disturbance to agricultural activities. The roads will be installed on gentle slopes or flat areas to reduce their visibility. The typical access road will be approximately 16 feet in width and surfaced with a granular wearing course.

During operation and maintenance of the wind power plant, the access roads will be used by operation and maintenance crews while inspecting and servicing the wind turbines. The roads will be maintained by periodic grading.

Water Supply. Construction, operation and maintenance of the proposed wind power plant will not significantly impact the water supply of the area. The project will not require the appropriation of ground or surface water nor will any dewatering take place into ground water or surface waters. The installation or abandonment of any wells is not required for the project. However, in the event wells are abandoned, they will be sealed and capped as required by North Dakota Law and the North Dakota Department of Health.

Railroad. The Development will have no significant impact on the local rail system.

Telephone. Construction, operation, and maintenance of the proposed wind power plant will not impact the telephone service to the area. The collector and feeder lines will not share the same right of way as the existing telephone lines. Just Wind will be working with the local telephone company to install communication lines and telemeter lines for the Development.

Radio Towers. One radio tower might be in the Development area during Phase 2. Impacts are not expected on the telecommunication or commercial radio activities by the operation of the wind power plant. (See EMF study results).

Television Reception. Operation of the wind power plant may or may not impact the quality of television reception in the area. Previous work on this subject indicates that in some cases new antenna or tuning of antennas has resolved the problem. Just Wind will attempt to work with the residents in the area of the Development site before and after the project is constructed to document and mitigate impacts that might occur.

Meteorological Towers. Some met towers will be installed throughout the Development site. That number is yet to be determined.

Mitigative Measures

Construction, operation, and maintenance of the proposed wind power plant will be in accordance with associated federal and state permits, as well as, Just Wind's construction and operations standards. Siting roads in area with unsuitable soil will be avoided whenever possible. Because the anticipated impacts on the existing infrastructure during construction, operation, and maintenance of the proposed wind power plant are minor, extensive mitigation measures will not be required for this plant.

Cultural/Archaeological

The cultural/archaeological review will be conducted jointly by the environmental study groups involved and the North Dakota State Historical Society.

The tallest structures of the proposed wind plant are the wind turbines. A three (3) bladed rotor with a diameter of 95 meters (266.76 feet) will be atop an 80 meter (262.46 feet) tower, resulting in a maximum overall height of 126.2 meters (329.19 feet). Since the highest point of the blade sweep exceeds 200 feet, notification must be made to the FAA and compliance with requirements imposed by the FAA must be followed on the wind power plant.

Electromagnetic Fields. Electromagnetic fields (EMF) are invisible lines of force that surround an electrical device and occur where an electrical conductor exists with an electrical current flowing through it. Examples of such conditions include high-voltage transmission lines, distribution (feeder) lines, substation transformers, house wiring, and electrical appliances. EMFs also occur in nature, in the form of the earth's direct current magnetic field and in electrical and magnetic fields generated during lightning storms.

Exposure to electric fields has not been proven to pose a long-term health threat. Concern has grown over the past 15 years about possible health effects resulting from exposure to magnetic fields. It is not known whether exposure to magnetic fields causes human injury or disease. The study of magnetic fields on the human body has not been demonstrated. To date, tests have shown inconsistent responses to different field of strengths. Many of the reports appearing in popular press linking magnetic field exposure to childhood cancer are based on the results of epidemiological studies. These studies have not been able to demonstrate a direct correlation between magnetic fields and human disease.

Consistently, expert review of panels commissioned by state, national, and foreign regulatory agencies have concluded that the existing body of research does not establish whether EMF poses significant health risks. They recommend more research to analyze issues raised by work done to date. Scientists continue to study magnetic fields and several nationwide research efforts are underway to investigate human exposure risks.

Railroad. A railroad runs northwest to southeast, just south of the Development site. It is the intentions of Just Wind to use a staging area adjacent to the railroad for the off loading of the nacelles. That negotiation is taking place with the turbine manufacturer.

Telephone. Service is provided by BEK Communications to the cities, rural developments, and homes in the proposed vicinity of the Development site. BEK will be the main communications network for the Development.

Radio Towers. There is the potential of one (1) radio tower to be located in the Development site.

Radar. There are no radar sites within or anywhere near the Development site. An FFA study will be required due to height regulations.

Impacts

The proposed wind power plant is expected to have a minimal effect on the existing public services and infrastructure. The following is a brief description of the impacts, which may occur during the construction, operation, and maintenance of the wind power plant.

Electrical Service. Construction of the project will add the following facilities to the existing electrical service in the proposed Development site: up to 160 2.3 MW turbines and associated power collection system, including power collection cable. Approximately/estimated that 150 miles of underground cable will be installed.

The power generated by the wind turbines and collected at the substation will be routed to the purchaser's utility system via the existing transmission lines.

Regardless of the scientific community's determinations regarding EMF and possible health effects, or lack thereof, the typically low EMF field strengths of the 34.5kV distribution lines in the proposed project area indicates that these sources should not substantially increase public exposure to EMF, and no adverse impacts to health or safety are expected.

Security. The proposed Development site is located in an area which has a low population density. Construction, operation, and maintenance of the project(s) will have minimal impacts on the security and safety of the local population.

The following measures will be taken to reduce the risk of personal injury and property damage:

- Just Wind will attempt to locate the wind turbines 1,000 feet from occupied homesteads and from 250 feet from public or developed roads.

- Security measures will be taken during construction, operation, and maintenance of the project(s), including temporary and permanent fencing, warning signs, and locks on equipment and wind power plant facilities.

- Each turbine door will be clearly labeled alphanumerically to identify each unit and a map of the site with the labeling system will be provided to local authorities as part of the fire protection plan.

- In winter months ice may accumulate on the wind turbine blades when the turbines are stopped or operating very slowly. Furthermore, the anemometer may ice up at the same time, causing the turbine to shut down during any icing event. As weather conditions change, any ice will nominally drop off the blades in relatively small pieces before the turbines resume operation. This is due to flexing of the blades and the blades smooth surface. Although turbine icing is a very infrequent event, it remains important that the turbines are not sited in areas where regular human activity is expected below the turbines or in the immediate proximity during the winter months.

Traffic. The existing traffic levels for the State Highways and County Roads in the project area are relatively low. County and township roads are the least traveled. No significant permanent changes in traffic patterns or volume are expected.

During the construction phase, several types of light, medium, and heavy-duty vehicles will travel to and from the Development site, as well as private vehicles used by the construction personnel. Based on developed experience, the worst-case scenario would be an average of 25-30 trips per day. That volume would occur during the peak time when the majority of the foundation work and wind turbine assembly is taking place. At such time, the majority of the heavy equipment and construction personnel will be entering or leaving the site. Other phases of construction would require less equipment and fewer personnel.

The operations and maintenance phase of the project will require approximately 12-20 people to monitor and maintain the wind turbines. There would be a slight increase in traffic for occasional turbine repair.

Impacts

The Development site is in an area of low population density; primarily a rural area with very little residential, commercial, or industrial development outside of the surrounding town boundaries. Wind tower technology has no air or water emissions. Impacts of the Development on public health and safety will be minimal.

Mitigative Measures

Airports are not located within the Development site; however, there is a local single directional runway system used primarily for crop dusting. Spraying and crop dusting of

the agricultural fields is conducted in the area. Notification of construction and operation of the wind power plant to the FFA will be completed and compliance with FAA requirements will be followed by the wind power plant. The wind power plant should not substantially increase public exposure to EMF; there, no adverse impacts to health and safety are expected. Significant permanent changes in traffic patterns or volume are not expected.

Land-Based Economics

Agriculture/Farming

Approximately 92 percent of the land in Logan County is utilized for agricultural purposes. Crop rotation is used extensively throughout the area. Corn, sunflowers, alfalfa, small grains, and pasture are reflective of crops in the area. Feeding cattle, raising livestock, and dairy farming are also major sources of income in the proposed project area.

The land in Logan County is used mainly for growing crops with some areas used for grazing. Farming is the most important enterprise in the county. Corn, sunflowers, soybeans, alfalfa, clover, small grains and hay are the main crops. The main livestock is beef and some buffalo.

The Conservation Reserve Program (CRP) is another source of farm income. Cropland is planted to conservation grasses and legumes to protect and improve the soil and can be harvested or pastured periodically. Within the Development site, the trend is toward fewer and larger farms.

Impacts

The proposed Development is compatible with existing land use plans. Approximately 64 acres of land in the Development site will be removed from its current use for the development, construction, operation and maintenance of the wind power plant. Agricultural activity and wildlife grazing is anticipated to occur between the wind turbines.

Mitigative Measures

The wind turbines and access roads will be located so that the most productive farmland (prime farmland) will be avoided as much as possible and they will not be located within sand/gravel pit operations.

Description of Resources

The major wetlands within the proposed project site mainly include: Paulstrine wetlands and small areas defined as a riverine wetland.

The Paulstrine System was developed to group the vegetated wetlands traditionally called such names as marsh, swamp, bog, fen, and prairie. It also includes the small, shallow, permanent or intermittent water bodies often called ponds. Paulstrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes. They may also occur as islands in lakes or rivers. The erosive forces of wind and water are of minor importance except during severe floods.

The Riverine System includes all wetlands and deepwater habitats contained within a channel, with two exceptions: wetlands dominated by trees, shrubs, persistent emergent, emergent mosses, or lichens and habitats with water containing ocean derived slats in excess of 0.5 percent. The Riverine System is bounded on the landward side by upland, by the channel bank, or by wetland dominated by trees, shrubs, persistent emergent, emergent mosses, or lichens. Water is usually, but not always flowing. Upland islands or Paulstrine wetlands may occur in the channel, but they are not included in the Riverine System. Paulstrine Moss-Lichen Wetlands, Emergent Wetlands, Scrub-Shrub Wetlands, and Forested Wetlands may occur adjacent to the Riverine System, often on a floodplain

Another wetland type identified within the Development site is:

- U-Primary represents upland areas, but may include unclassified wetlands such as man-modified areas, non-photo-identifiable areas, and/or unintentional omissions.

Impacts

The wind turbines will be built to capture the wind resource and to avoid wetlands on the lower positions in the landscape. Access roads and ancillary wind power plant features will be designed to minimize impacts on the wetlands.

Mitigative Measures

Wetlands will be avoided during the construction phase of the wind power plant. A General Storm Water Construction Plan will be prepared by Houston Engineering and submitted for the Development. The General Construction Storm Water Plan requires

that temporary and permanent erosion and sediment control plans be developed. The goal of the plan is to prevent erosion from occurring and to keep sediment on the site during construction. Erosion control measures will be installed prior to construction and maintained throughout the construction until areas disturbed have successfully re-vegetated.

If it appears that wetlands could become affected, Just Wind will follow the requirements of the applicable program and work with governing entities to reduce or eliminate wetland impact or if necessary, replace or substitute wetland values or resources where avoidance is not feasible.

Vegetation

Information on the existing vegetation in the proposed Development site will be obtained from Houston Engineering's Environmental Review.

The following sections do not include any discussion on vegetation species considered by the state to be threatened, endangered, or of special concern. Refer to Section 17 Rare and Unique Natural Resources for information on these resources.

Description of Resources

The pre-settlement vegetation within the Development site consists of medium and tall grass prairie with wet prairie covering a small proportion of the Development area. Agriculture is the primary land use in the Development site area and few remnants of pre-settlement vegetation remains.

Fire and drought were and still are the dominant causes of natural disturbance. Fires were common before settlement, re-energizing the prairie plant communities.

Farmland currently occupies a majority of the Development site. The land consists of pasture, and agricultural crop land.

Impacts

Construction of the proposed wind power plant will result in the permanent disturbance of approximately 64 acres. Some vegetation will be permanently removed and converted to the wind power plant. Some additional acreage will be temporarily disturbed during the construction and operation and maintenance of the wind power plant (contractor staging area, underground, power lines). The wind turbines require

uninterrupted airflow, therefore, they will be constructed at a certain distance from buildings and tree groves to maximize wind turbine output and reduce any need for tree removal. Operation and maintenance of the wind power plant and its subsequent development, operation and maintenance:

- Conduct a pre-construction inventory of existing wildlife management areas, scientific and natural areas, recreation areas, wetlands, native prairie, and tree groves.
- Exclude established wildlife management, recreation and scientific natural areas from consideration for wind turbine locations, access roads, or electrical/transmission line placement.
- Avoid disturbance of individual wetlands during construction of the project.
- Protect existing trees and shrubs.
- Maintain sound water and soil conservation practices during construction and operation of the project to protect topsoil and adjacent resources and to minimize soil erosion. Practice may include containing excavated material, protecting exposed soil and stabilizing restored material.
- Re-vegetate non-cropland and range areas with wildlife conservation species and wherever possible, plant native tall grass prairie species in cooperation with landowners.

Wildlife

Information on the existing wildlife in the proposed Project site will be obtained from a variety of sources, including the North Dakota Game and Fish Department, the U. S. Fish and Wildlife Service and the Environmental Review developed by Houston Engineering.

The following sections do not include any discussion on wildlife species considered by the state to be threatened or endangered or of special concern. Refer to Section 17 Rare and Unique Natural Resources for information on these resources.

Description of Resources

Wildlife within the Project site consists of birds, mammals, herpetiles, and insects-both resident and migratory-which utilize the area habitat for forage, breeding, and/or shelter. The resident species are representative of North Dakota game and non game fauna which are associated with upland grass and farm lands with few wetland areas. The majority of the migratory wildlife species are birds including waterfowl and song birds. The principle migration routes for the large number of waterfowl which pass through North Dakota each year in the spring and fall, to and from northern breeding

grounds, lie outside of the project area. However, some migrants do pass over the study area at elevations of 1,000 to 10,000 feet.

Resident Birds. Resident bird species are those that occupy the proposed Project site throughout the year. The resident bird species include the game birds, which form the most important economic component of this group.

Migratory Birds. Migratory bird species are those which may use the Development site for resting, foraging, or breeding activities for only a portion of the year.

Mammals. Mammal species that are expected to occur within the Development site.

These species use the food and cover available from agricultural fields, grasslands, farm woodlots, wetlands and wooded ravines. Agricultural crops provide seasonal food sources for the herbivores and omnivorous species.

Grassland areas and woody vegetation are also habitat for a variety of small mammals including mice, which serve as food base for larger carnivorous and omnivorous mammals and birds. Natural predator-prey relationships exist between some of the species.

White-tailed deer, an economically important species, have a strong affinity for agricultural crops and use farm woodlots, wooded ravines and intermittent stream bottoms for shelter. Winter yarding is reported in the prairie hills where wooded ravines are present.

Herpeiles. Reptile and amphibian species, which may use the grassland areas within the Project site.
It is unlikely that the water dependent species occur in the Project site because of the lack of significant amounts of water.

Insects. While many species are important to the indigenous vegetation and wildlife, honey bees are the only species economically important within the Development site.

Impacts

Development of the wind power plant, including the construction and operation of the project, is expected to produce a minimal impact to wildlife. Based on studies of existing wind power projects in the United States and Europe, the greatest impact to wildlife would occur to migrant and resident avian populations. (Add more after Avian

studies).

The impact of the proposed wind power plant on resident wildlife is expected to be minimal. The only measurable impact is a small percentage reduction in the available habitat, which the resident wildlife uses for forage or cover. Operation and maintenance of the wind power plant will not change the existing land use.

Mitigative Measures

The following measures will be used to help avoid or alleviate potential conflicts and impacts on the wildlife of the area during the final siting of the wind power plant and its subsequent development, operation, and maintenance:

- Conduct a pre-construction inventory of existing wildlife management areas, scientific and natural areas, recreation areas, wetlands, and native prairies.
- Exclude established wildlife management, recreation and scientific natural areas from consideration for wind turbine locations, access roads or electrical/transmission line placement.
- Avoid disturbance of individual wetlands or drainage systems during construction of the project.
- Protect existing trees and shrubs, which are important to the wildlife present in the area.
- Avoid construction activities within deer-wintering yards during winter.
- Maintain sound water and soil conservation practices during construction, operation, and maintenance of the wind power plant to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material. Protecting exposed soil, and stabilizing restored material.
- Re-vegetate non-cropland and range areas with wildlife conservation species.

Rare and Unique Natural Resources

The Endangered Species Act of 1973, as amended, requires that a consultation pursuant to Section 7 be conducted to insure that a proposed project will not affect the continued existence of any endangered or threatened species or adversely affect their habitats, and that corrective action be taken if adverse impacts may occur. The North Dakota Game and Fish Department maintains a Comprehensive Wildlife Conservation Strategy a.k.a. Wildlife Action Plan, which is the most complete source of data on North Dakota's rare, endangered or otherwise significant plant and animal species, plant communities and other natural features.

Tourism and Community Benefits

Description of Resources

Logan County focuses on promoting the areas abundant game and wildlife, lakes and recreational areas.

Impacts

Wind development may become a significant tourism attraction, bringing more visitors to the community. Potentially, the community could benefit from revenues generated by tourism dollars for hotel rooms, restaurant, and other goods and services. Wind generation could become a new addition to the community's calendar of events. The Renewable Energy Center should be a great addition to this process.

Topography

See accompanying map reference manual

Soils

More Detail in enclosed environmental review.

Geologic and Groundwater Resources

More Detail in enclosed environmental review.

Surface Water and Floodplain Resources

More Detail in enclosed environmental review.

Wetlands

Delineated wetlands for the proposed Project site wee identified from reviewing National Wetland Inventory (NWI) Maps developed by the United States Department of the Interior and Fish and Wildlife Service and depicted on U. S. 7.5 Minute Topographic Maps.

Description of Resources

Houston Engineering's Environmental Review along with the results of the EIS will assess if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the Development site.

A survey of rare features has not yet been completed for Logan County; therefore, there may be rare or otherwise significant natural features for which no records exist on the Development site.

Impacts

Construction of the proposed wind power plant(s), will result in the disturbance of approximately 64 acres for the Phase one (1) part of the Development. The vegetation (habitat) will be permanently removed and converted to access roads or wind turbines to support the proposed design for the wind power plant(s). Additional acres will be temporarily disturbed during construction of the wind power plant(s) (contractor staging areas and underground power lines).

The permanent removal of vegetation will result in less habitat available for breeding, forage, or nesting of state-listed butterfly species. These species are associated with the prairie. Habitat loss and degradation is a contributing factor to the decline of these butterflies as they are dependent on specific plant community types for survival.

Operation and Maintenance of the proposed wind power plant(s) will not affect the state-listed butterfly species. Wind Turbine blades operate at heights which are generally well above the normal flight patterns of the butterfly species listed by the state.

Mitigative Measures

The following measures will be used to avoid or alleviate potential conflicts on the state-listed butterfly, and plant species of the area during final siting of the wind power plant(s) and its subsequent development, operation, and maintenance:

- Conduct a pre-construction inventory of the Development site to assess the presence of state-listed species and sensitive habitats (wetlands and native prairie).
- Avoid placing wind turbines and wind power plant facilities in or disturbing those areas identified in the pre-construction survey, which contain state-listed species, wetlands, or native prairie.

Adverse Human and Environmental Effects Which Cannot be Avoided

Aesthetics. The wind turbine arrays will be prominent features in the landscape. By design, these structures are placed in open areas some in higher elevations. Some mitigative measures, can be implemented to somewhat limit visual impacts. However, it is inevitable that the wind turbines will be noticed. The degree to which the visual impacts are considered adverse is subjective, and can be expected to vary depending on the viewer's perspective.

Commitment of Land. The proposed Development will be sited on land for which Just Wind currently has legal, valid, and binding contracts for wind energy rights. Approximately 824 acres will actually be impacted with turbines and related equipment, access roads, and maintenance facilities; which will include re-vegetation and site restoration. The existing use of this land can continue as agricultural of open fields. Some areas will be affected as the character of the land surface changes from vegetation of agricultural field to gravel roads, tower foundations, or maintained grassy areas.

Wind Turbine and Substation Noise. When in motion, the wind turbines emit a perceptible sound. The level of this noise varies with the speed of the wind turbine and the distance of the listener to the turbine. On relatively windy days, the turbines create more noise; however, the ambient, or natural, noise level simply from the wind tends to override the wind turbine noise as distance from the turbines increases. The noise generated by the wind turbines is less than 45 dBA at an average distance of 500 feet.

Avian Impacts. Occasional collisions of avian species with turbine blades occur at wind power plants. The frequency of these collisions depends upon the spacing and number of turbines, as well as the size of the local and migrating avian species that frequent the project area. The wind turbines must be spaced far apart to avoid interference or wake effects. This design tends to lower the number of avian collisions. While a number of different species of birds use the project area for habitat.