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LIST OF ACRONYMS AND ABBREVIATIONS

AD	*Anno Domini* ("in the year of our Lord")
AMNH	American Museum of Natural History
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ATV	All-terrain vehicle
AWEA	American Wind Energy Association
B.P.	Before present
C.F.R.	*Code of Federal Regulations*
CDOW	Colorado Department of Wildlife
CGS	Colorado Geological Survey
CNHP	Colorado Natural Heritage Program
CRP	Conservation Reserve Program
CU	Colorado University
dBA	A-weighted decibels
DMNS	Denver Museum of Natural Science
EA	Environmental assessment
EPA	Environmental Protection Agency
EMI	Electromagnetic interference
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FR	*Federal Regulations*
FWS	U.S. Fish and Wildlife Service
GIS	Geological information system
GLO	General Land Office
GMU	Game Management Unit
gpm	Gallon(s) per minute
GPS	Global positioning system
IEEE	Institute for Electrical and Electronic Engineers
IPCEA	Insulated Power Cables Engineers Association
kV	Kilovolt(s)
mph	Mile(s) per hour
MW	Megawatt(s)
NEMA	National Electrical Manufacturer's Association
NEPA	*National Environmental Policy Act*
NESC	National Electrical Safety Code
NETA	National Electrical Testing Association
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NWCC	National Wind Coordinating Committee
NWI	National Wetlands Inventory
O&M	Operations and maintenance
OSHA	Occupational Safety and Health Administration
PDEIS	Preliminary draft environmental impact statement
ROW	Right-of-way
RV	Recreational vehicle
SCE	Spring Canyon Energy, LLC
SHPO	State Historic Preservation Office
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SWPPP	Storm Water Pollution Prevention Plan
T&E	Threatened and endangered
TCP	Traditional Cultural Property
TEP&C	Threatened, endangered, proposed, and candidate
USGS	U.S. Geological Survey
Western	Western Area Power Administration
WRCC	Western Regional Climate Center
WUS	Waters of the U.S.

EXECUTIVE SUMMARY

Project Location

The Spring Canyon wind project (formerly known as the Peetz Table wind project) would be constructed on private land located east of Peetz, in Logan County, Colorado.

Project Participants

Spring Canyon Energy LLC (SCE), a wholly owned affiliate of Invenergy, applied to the Western Area Power Administration (Western) to interconnect a 130-megawatt (MW) wind power facility to Western's existing 230-kilovolt (kV) Sidney to North Yuma transmission line. Western is the lead Federal agency for compliance with *the National Environmental Policy Act of 1969* (NEPA) as amended. There are no cooperating agencies. This environmental assessment (EA) was prepared in accordance with NEPA to assess the impacts of constructing and operating the wind project, which would be enabled by Western's execution of the interconnect agreement (a Federal action).

SCE is a private wind power development company with over 25 projects in the U.S. and Canada and a mission to develop, own, and operate projects throughout North America. SCE originates and develops wind projects from conception through completion and long-term operation. SCE has obtained a Power Purchase Agreement with Xcel Energy for 60-MW and would obtain a Power Purchase Agreement with one or more other power distributors, who would purchase the power generated by the wind project and distribute it to customers.

Western, an agency of the U.S. Department of Energy, is responsible for marketing Federal electric power and transmission service in 15 central and western states. Western markets power to over 600 customers including rural electric cooperatives, municipalities, public utility districts, Federal and state agencies, irrigation districts, and private utilities (Western 1999). The power customers, in turn, provide electric service to millions of retail consumers. Electric power

marketed by Western is generated by the U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, and the International Boundary and Water Commission, which operate 55 hydropower generating plants in Westerns' service area.

Purpose and Need

NEPA requires Federal decision-makers to consider the environmental effects of their actions. The agency responsible for complying with NEPA for this proposed action is Western. SCE applied to interconnect with Western's transmission system. Western must respond to SCE's request for an interconnection with its transmission system. In responding to this request, Western will apply the terms and conditions of its Open Access Transmission Tariff and Interconnection Guidelines in considering SEC's request. Western's decision is limited to deciding if the specific wind project proposed by the applicant can be interconnected with Western's transmission system. Western's approval of this interconnection would enable the Spring Canyon wind project to proceed.

Executing an interconnection agreement would be consistent with Western's mission, described above. The primary purpose of the Spring Canyon wind project is to provide wind-generated electricity from a site in Colorado to further the objectives of the President's National Energy Policy to diversify energy sources by making greater use of non-hydroelectric renewable sources such as wind power (National Energy Policy Development Group 2001) and to meet customer demand for inexpensive energy from renewable energy resources. The project also would meet the demand for renewable energy resources created by the recent successful ballot initiative in Colorado requiring utilities to generate 10% of the state's energy from renewable resources by 2015.

Alternatives

Proposed Action. Under the Proposed Action, Western would execute an interconnection agreement to connect the wind project to Western's existing Sidney to North Yuma 230-kV

transmission line (see Western [1991] for information regarding this transmission line). SCE would construct and operate a 130-MW wind energy facility on privately owned land on Peetz Table, east of Peetz, in Logan County, Colorado. Phase I would consist of about 60 MW to be constructed in 2005, pending successful completion of the environmental review process. The size and timing for the construction of subsequent phases is not known at this time, but the entire 130-MW project is evaluated in this EA. Although the project would have an installed capacity of 130-MW, it is expected to operate at about 38% capacity, so actual output would average about 49 MW. SCE has obtained or will obtain leases from private landowners to construct and operate the wind project. The project footprint (i.e., the area to be disturbed during construction and throughout 40-year life-of-project) would be limited to the areas immediately adjacent to turbines and access roads.

The wind project would consist of approximately 87 1.5-MW or 72 1.8-MW wind turbines and associated facilities. Phase I would consist of about 40 turbines. The wind turbine generators would be supported by 80-meter tubular towers. Towers and generators would be white. Support facilities would include step-up transformers, a substation, underground and overhead power collection and communication lines, roads, and an operation and maintenance (O&M) building.

Access to the project area would be via Colorado Highway 113 and a network of existing county and private roads within the project area. Access to wind project facilities, including individual turbines, would be provided by new access roads to be constructed for the purposes of wind project construction and operation.

SCE proposes to implement Western's standard construction, operation, and maintenance practices, where applicable, to avoid and minimize impacts to the environment to the extent practicable. These measures are part of SCE's proposed project and Western's Proposed Action and are considered in this EA's impact analysis. SCE also proposes to implement additional mitigation measures to avoid, reduce, or eliminate impacts related to SCE’s Proposed Action.

No Action. Under the No Action Alternative, Western would not execute an interconnect agreement with SCE, and the wind project would not be constructed.

Summary of Impacts for the Preferred Alternative

The Proposed Action is Western's preferred alternative and it would have no significant impacts based on the significance criteria and impact analysis conducted. The Proposed Action would have certain impacts, both beneficial and adverse, which are summarized below.

Air Quality. The Proposed Action would have beneficial impacts on air quality because greenhouse gases and other pollutants emitted by conventional fossil fuel combustion would not be produced. Construction and operation would result in small amounts of dust and tailpipe emissions from vehicle traffic.

Topography. Minor impacts to topography would include temporary or permanent changes in the land surface and slope due to cut-and-fill activities required to excavate foundations and build roads.

Paleontology. Direct impacts to fossils could include the inadvertent destruction of scientifically important fossils during excavation.

Soils. Approximately 222 acres of soils would be impacted during initial construction and approximately 69 acres would remain under roads, turbines and facilities for the life-of-project (about 40 years). Impacts to soils due to the project would be either minor and temporary or minor and long-term (in project footprint). Impacts would include soil loss through erosion, compaction, and loss of structure in soils that are disturbed or driven on during construction.

Water Resources. Potential impacts to surface water quality include increased turbidity, salinity, and sedimentation of surface waters due to runoff and erosion from disturbed areas. Accidental

spills of petroleum products or other pollutants also could impact surface water quality. The project would result in the consumption of surface and/or ground water.

Vegetation. Direct impacts to vegetation would include disturbance of 222 acres during construction; 84 acres of native prairie, 102 acres of cropland, and 36 acres of Conservation Reserve Program (CRP) land. Most of the disturbed area would be reclaimed and revegetated, with 69 acres remaining occupied by roads, turbine foundations, and facilities for the life-of-project (26 acres of native prairie, 32 acres of cropland, and 11 acres of CRP land). There would be no impacts to riparian vegetation. Weed infestations could also constitute an adverse effect.

Floodplains and Wetlands. Floodplains and wetlands would not be impacted.

Wildlife. Impacts to mammals (except possibly bats), reptiles, and amphibians are expected to be minimal because the land is primarily agricultural and subject to regular human activity from farming and ranching activities. Bats may be impacted due to collision-related mortality associated with operating wind turbines. Other wind projects are known to cause substantial bat mortality. However, since bats are not known to roost in the area and none of the four species that may occur in the area are Federal- or state-listed TEP&C species, impacts to bats are not expected to be significant.

Birds may be directly impacted due to collisions with turbines, meteorological towers, overhead power lines, and substation structures, and through habitat loss due to vegetation disturbance, human presence, and noise. The potential impacts of wind power development on birds is well-documented, but wind power-related mortality is low compared with other sources of bird mortality. The project is largely in conformance with U.S. Fish and Wildlife Service (FWS) recommendations for avoiding and minimizing impacts to wildlife from wind turbines.

Special Status Species. The project may affect, but is not likely to adversely affect, bald eagles. The project may adversely affect the whooping crane, interior least tern, piping plover, and/or pallid sturgeon, designated whooping crane critical habitat, and proposed piping plover critical

habitat. No mitigation is required because the U.S. Forest Service and the FWS have provided funds to a Fish and Wildlife Foundation account for the purposes of offsetting the adverse effects of Federal agency actions resulting in minor water depletions, such as the Spring Canyon Wind Energy Project.

The project is expected have low to no impacts on state-listed species, including western burrowing owl, ferruginous hawk, long-billed curlew, mountain plover, peregrine falcon, sandhill crane, black-tailed prairie dog, northern pocket gopher, and swift fox.

Cultural Resources. No National Register of Historic Places (NRHP)-eligible cultural resource sites were identified during the Class III cultural resource inventory conducted for the project. The 23 historic (9) and prehistoric (14) sites recorded during the inventory are all recommended as not eligible for the NRHP. No Traditional Cultural Properties (TCPs) are known to occur within the project area, and no TCPs were identified during the current inventory. Because the sites are recommended as not eligible for the NRHP, construction activities would have no project effect on these cultural resources.

Land Use, Recreation, and Transportation. The project would result in the initial disturbance of approximately 84 acres of shortgrass prairie, 102 acres of agricultural land, and 36 acres of CRP land. Life-of-project disturbance would include disturbance of 25 acres of shortgrass prairie, 32 acres of agricultural land, and 11 acres of CRP land. All existing land uses would continue as they were prior to development, with the possible exception of hunting, which would be precluded in the vicinity of wind turbines, transformers, and other facilities that could be damaged by ammunition fired during hunting.

Traffic will increase on the roads leading to and within the project area during the construction stage, as equipment is transported into the area. Large pieces of equipment such as rotor blades are over-sized loads that may temporarily slow traffic as they are moved into the project area. This increased heavy traffic would also cause additional wear on existing roads; however, the

increase in traffic would not cause a major change in the transportation network in the project area.

Noise. Construction noise would exceed ambient noise levels and may be heard for some distance within the project area. Truck traffic, heavy equipment, and possibly foundation blasting would cause elevated noise levels at and near construction sites.

Both the nearest residence and the nearest raptor nest are approximately 900 ft from the nearest wind turbine, so wind turbine noise levels would be about 40 A-weighted decibels (dBA), similar to rural night-time ambient noise levels. Generally, the sound of the wind will mask turbine noise, especially since turbines only operate when wind speeds reach a certain threshold. SCE will use state-of-the-art turbines that have been designed to minimize noise levels (e.g., upwind rotors, thinner blade tips, streamlined towers and nacelles), so it is anticipated that wind turbine noise impacts to residents and wildlife would not be significant.

Visual Resources. The wind turbines would change the aesthetics of the landscape with the addition of tall towers and rotating blades--whether this effect is deemed beneficial or adverse depends on viewer perspective and sensitivity. The proposed wind project likely would be more visible than the existing wind project west of Peetz because the turbines would be taller and more numerous. The substation, access roads, overhead power lines, vehicles, and dust also would impact visual resources. The substation would be viewed most frequently by local landowners, and it would represent an industrial facility in a rural landscape. The project area already contains 41.4 mi of roads; construction of approximately 26 more miles would constitute a 63% increase in the number of roads in the project area.

Current Federal Aviation Administration (FAA) requirements for wind turbine lighting typically include red, simultaneously pulsating night-time lighting and no daytime lighting (white towers are sufficiently visible to pilots). Red night-time lights are less intrusive to humans than white night-time lights. SCE is preparing a lighting plan to meet FAA requirements while minimizing the number of lights for the project.

Socioeconomics. No new community or county infrastructure would be required to support project construction or O&M. The project would generate sales and use taxes for goods and services purchased during construction and operation. It also would provide property taxes to the town of Peetz and to Logan County. The project would employ 25 workers during construction and would create 8-10 permanent O&M jobs. All of these impacts would be beneficial to the affected towns/cities, to Logan County, and to the State of Colorado. Logan County and the City of Sterling are low income communities in the area of potential effect, but the project is expected to generate revenue needed by the county and the city, so no adverse effects to low income communities would occur. Furthermore, the project would generate revenue for the private landowners on whose land the project is located, further benefiting the area's economy.

Cumulative Impacts. No significant cumulative impacts are anticipated.

Unavoidable Adverse Effects. Unavoidable adverse effects--residual impacts that likely would remain after mitigation--would include the following:

- Fossil fuels and water would be consumed and labor and materials would be expended during construction and, to a much lesser extent, during operation (e.g., O&M vehicle fuel). This would be offset by renewable energy produced through wind rather than consumption of fossil fuel.
- Some damage to, or illegal collection of, paleontological or cultural resources may occur.
- Up to 222 acres of soil and vegetation disturbance would occur, resulting in some soil loss and some stream sedimentation, until disturbed areas are successfully reclaimed. Up to 69 acres of vegetation would be lost for the 40-year life-of-project.
- Some additional emissions of fugitive dust, sulfur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, and volatile organic compounds would occur.
- Some wildlife mortality would occur.

1.0 PURPOSE AND NEED

1.1 INTRODUCTION

Spring Canyon Energy LLC (SCE), a wholly owned affiliate of Invenergy, applied to the Western Area Power Administration (Western) to interconnect a 130-megawatt (MW) wind power facility to Western's existing 230-kilovolt (kV) Sidney to North Yuma transmission line. The Spring Canyon wind project, formerly known as the Peetz Table wind project, would be constructed on private land located east of Peetz, in Logan County, Colorado (Figure 1.1). Western is the lead Federal agency for compliance with *the National Environmental Policy Act of 1969* (NEPA) as amended. There are no cooperating agencies. This environmental assessment (EA) was prepared in accordance with NEPA to assess the impacts of constructing and operating the wind project, which would be enabled by Western's execution of the interconnect agreement (a Federal action).

SCE is a private wind power development company with over 25 projects in the U.S. and Canada and a mission to develop, own, and operate projects throughout North America. SCE originates and develops wind projects from conception through completion and long-term operation. SCE has obtained a Power Purchase Agreement with Xcel Energy for 60-MW and would obtain a Power Purchase Agreement with one or more other power-distributors, who would purchase the power generated by the wind project and distribute it to their customers.

Western, an agency of the U.S. Department of Energy, is responsible for marketing Federal electric power and transmission service in 15 central and western states. Western markets power to over 600 customers including rural electric cooperatives, municipalities, public utility districts, Federal and state agencies, irrigation districts, and private utilities (Western 1999). The power customers, in turn, provide electric service to millions of retail consumers. Electric power marketed by Western is generated by the U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, and the International Boundary and Water Commission, which operate 55 hydropower generating plants in Westerns' service area.

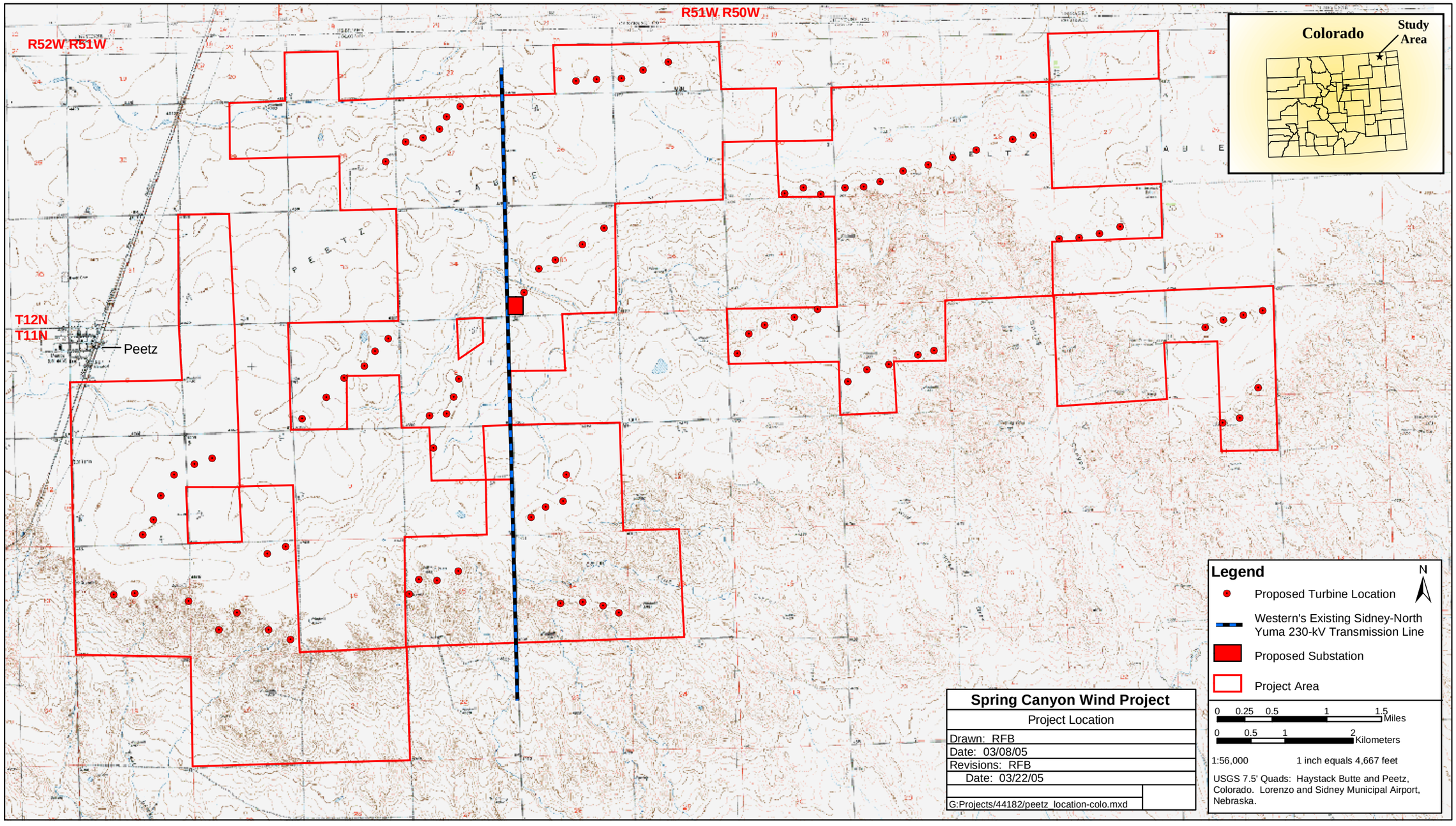

Figure 1.1 Project Location.

1.2 PURPOSE AND NEED

1.2.1 Federal Agency Action

NEPA requires Federal decision-makers to consider the environmental effects of their actions. The agency responsible for complying with NEPA for this proposed action is Western. SCE applied to interconnect with Western's transmission system. Western must respond to SCE's request for an interconnection with its transmission system. In responding to this request, Western will apply the terms and conditions of its Open Access Transmission Tariff and Interconnection Guidelines in considering SEC's request. Western's decision is limited to deciding if the specific wind project proposed by the applicant can be interconnected with Western's transmission system. Western's approval of this interconnection would enable the Spring Canyon wind project to proceed.

1.2.2 Applicant's Purpose and Need

Executing an interconnection agreement would be consistent with Western's mission, described above. The primary purpose of the Spring Canyon wind project is to provide wind-generated electricity from a site in Colorado to further the objectives of the President's National Energy Policy to diversify energy sources by making greater use of non-hydroelectric renewable sources such as wind power (National Energy Policy Development Group 2001) and to meet customer demand for inexpensive energy from renewable energy resources. The project also would meet the demand for renewable energy resources created by the recent successful ballot initiative in Colorado requiring utilities to generate 10% of the state's energy from renewable resources by 2015.

1.3 SCOPING

Public and regulatory agency involvement is critical in analyzing the proposed Spring Canyon Wind Project. Western notified stakeholders of the project and solicited information on their

concerns through scoping letters, dated January 6, 2005, and January 10, 2005 (see Appendix G). The parties contacted included federal, tribal, state, and local governments and other interested organizations and landowners. Western received direct responses from the following agencies and tribes: Oglala Sioux Tribe, Comanche Tribe of Okalahoma, U.S. Fish and Wildlife Service (FWS), Colorado State Historic Preservation Office (SHPO), and the Logan County Commissioners. The SHPO consultation and concurrence letters are included in Appendix H. Western also received responses from eight landowners. Western consulted with the FWS and Colorado Division of Wildlife (CDOW) in writing and informally, which included site visits and meetings. The FWS consultation letter and biological opinion are included in Appendix F, Addenda F-C and F-D, respectively. All correspondence from state and federal agencies and tribal governments is available.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 WESTERN'S PROPOSED ACTION

Western's Proposed Action is to approve the interconnection request.

2.2 DESCRIPTION OF SCE'S PROPOSED PROJECT

2.2.1 Overview

Under the Proposed Action, Western would execute an interconnection agreement to connect the wind project to Western's existing Sidney to North Yuma 230-kV transmission line (see Western [1991] for information regarding this transmission line). SCE would construct and operate a 130-MW wind energy facility on privately owned land on Peetz Table, east of Peetz, in Logan County, Colorado. Phase I would consist of about 60 MW to be constructed in 2005, pending successful completion of the environmental review process. The size and timing for the construction of subsequent phases is not known at this time, but the entire 130-MW project is evaluated in this EA. Although the project would have an installed capacity of 130-MW, it is expected to operate at about 38% capacity, so actual output would average about 49 MW. SCE has obtained or will obtain leases from the private landowners to construct and operate the wind project. For the purpose of this EA, the project area includes all lands within the Project Area Boundary on Figure 1.1. The project footprint (i.e., the area to be disturbed during construction and throughout the 40-year life-of-project) would be limited to the areas immediately adjacent to turbines, access roads, and other facilities (Table 2.1). For the purposes of field surveys for sensitive resources (i.e., Federal- and state-listed threatened, endangered, proposed, and candidate [TEP&C] species and their habitat; wetlands and other waters of the U.S. [WUS]; and cultural resources), a 2,000-ft wide corridor, centered on turbine strings and access roads, and a 50-ft wide corridor centered on collection line locations and crane paths (see below) were surveyed within the project area. These 2,000-ft and 50-ft wide corridors (Figure 2.1) include 6,424 acres within the 22,054-acre project area. Surveys were confined to the project area because access was not available on the private lands outside or the project area.

Table 2.1 Estimated Surface Disturbance Acreage.

Disturbance Type	Initial Disturbance (acres)	Life-of-project Disturbance (acres)
Turbine assembly areas/pads[1]	80	3
Turbine string corridors (collection line trenches and access roads)[2]	102	47
Other access roads (outside turbine corridors)[3]	8	4
Staging areas and turnarounds[4]	5	5
Collection line trenches (outside turbine corridors)[5]	14	0
Crane paths[6]	0	0
Overhead collection lines[7]	3	<0.1
Substation and O&M building	10	10
Total	222	69

1 Assumes a 200 x 200 ft assembly area during construction and a 40 x 40 ft permanent pad; assumes 87 1.5-MW turbines

2 Assumes 24 mi of corridors, 35 ft wide during construction, reclaimed to 16 ft wide for the life-of-project.

3 Assumes 2 mi of access roads outside of turbine corridors, 35 ft wide during construction, reclaimed to 16 ft wide for the life-of-project.

4 Assumes 5 1.0-acre staging areas/turnarounds.

5 Assumes 28 mi of collection line trenches outside turbine corridors, up to 4 ft wide during construction, completely reclaimed for the life-of-project.

6 Crane paths would not be constructed but would result from the overland passage of the large crane.

7 Assumes 1 mi of overhead collection lines, 25 ft wide during construction, reclaimed except for pole locations for life-of-project (100 poles each occupying 2 ft x 2 ft = 0.01 acre).

Note that, while the 2,000-ft wide survey corridor includes the 130-MW project, the 50-ft corridor is for Phase I only. Additional surveys would be required to cover the collection systems and crane paths for subsequent phases. During construction, a large crane would be used to erect towers and turbines, and it would be walked either along project access roads, along collection line corridors, or cross-country along corridors referred to as crane paths.

The wind project would consist of approximately 87 1.5-MW or 72 1.8-MW wind turbines and associated facilities (see Figure 2.1). The wind turbine generators would be supported by 80-m tubular towers (Figure 2.2). Towers and generators would be white. Support facilities would

include step-up transformers, a substation, underground and overhead power collection and communication lines, roads, and an operation and maintenance (O&M) building.

Access to the project area would be via Colorado Highway 113 and a network of approximately 41.4 mi of existing county roads within the project area (see Figure 2.1). Access to wind project facilities, including individual turbines, would be provided by new access roads to be constructed for the purposes of wind project construction and operation.

2.2.2 Construction

The proposed project would use standard construction procedures as used for other wind project developments in the western U.S. These procedures, with minor modifications to allow for site-specific circumstances, are summarized below.

Wind project construction would entail the following activities, listed in approximate order of occurrence, although some of the activities occur simultaneously:

- road and pad construction;
- digging, drilling, and possible blasting of foundation footings for towers;
- pouring concrete foundations for turbine towers, meteorological towers, transformer pads, and substations;
- trenching for underground utilities;
- placement of underground electrical and communications cables in trenches;
- overhead electrical power system construction;
- installation of tower lights;
- electrical connection to tower;
- tower assembly, erection, and equipment installation;
- final testing, and
- final road grading, erosion control, site clean-up, and reclamation.

Construction equipment would include standard dirt-moving equipment, cranes, trucks, and forklifts (Table 2.2).

2.2.2.1 Road and Pad Construction

Access roads would be constructed in accordance with landowner easement agreements. Roads would be located to minimize disturbance and maximize transportation efficiency and to avoid sensitive resources and steep topography. An estimated 26 mi of new access roads would be required for the project (see Figure 2.1 and Table 2.1); 24 mi of which would be located adjacent to turbine strings.

Roads would be built and maintained to provide safe operating conditions at all times. The minimum full surfaced travelway width would be 16 ft; overall surface disturbance could be up to 35 ft wide (see Table 2.1 and Figure 2.3). Disturbance width may increase in steeper areas due to cuts and fills necessary to construct and stabilize roads on slopes.

Table 2.2 List of Construction Equipment Typically Used for Wind Project Construction.

Equipment	Use
D7 bulldozer	Road and pad construction
Grader	Road and pad construction
Water trucks	Compaction, erosion and dust control
Roller/compactor	Road and pad construction
Backhoe	Digging foundations and trenches for utilities
Trenching machine	Digging trenches for underground utilities
Truck-mounted drill rig	Drilling meteorological tower foundations
Concrete trucks and pumps	Pouring tower and other structure foundations
Cranes	Tower and turbine erection
Dump trucks	Hauling road and pad material
Flatbed trucks	Hauling towers and other equipment
Pickup trucks	General use and hauling minor equipment
Small hydraulic cranes and forklifts	Loading and unloading equipment
Four-wheel drive all-terrain vehicles (ATVs)	Rough grade access and underground cable installation
Rough terrain forklifts	Lifting equipment

Topsoil removed during new road construction would be stockpiled in elongated piles within road easements. Topsoil would be re-spread on cut-and-fill slopes and these areas would be reclaimed in accordance with easement agreements.

During construction and O&M of the wind project, traffic would be restricted to the roads developed for the project. Use of unimproved roads would be restricted to emergency situations. Speed limits would be set to ensure safe and efficient traffic flow. Signs would be placed along the roads, as necessary, to identify speed limits, travel restrictions, and other standard traffic control information.

Turbine pads would be constructed using standard cut-and-fill procedures.

2.2.2.2 Foundations and Tower Erection

Turbine towers would be anchor-bolted to concrete foundations. SCE either would use a deep foundation (Figure 2.4) or a shallow foundation (Figure 2.5). Foundations would be excavated using a backhoe or other appropriate excavation equipment. Concrete molds would be used to pour two rings of concrete, and steel anchor bolts would be embedded in the concrete. The foundations would be backfilled and allowed to cure prior to tower erection. Tower foundations are designed to withstand 120 mph winds on the towers.

Turbine tower assembly and erection would occur within the designated easement. The turbine string corridor would consist of tower assembly areas and pads (200 x 200 ft during construction) and access roads (see Figure 2.3). Trenches for collection and communications lines would be excavated in access road rights-of-way (ROWs) or in cross-country collection line easement corridors. Following construction, portions of the tower assembly areas, pads and roads and all trenched areas would be reclaimed. Turbine assembly areas would be reduced to a 40 x 40-ft pad area and road/trench width would be reduced to approximately 16 ft.

Approximately three meteorological towers would be erected. Meteorological towers approximately 197 ft to 263 ft tall would be erected, primarily within turbine string corridors, on 3-ft diameter pier foundations. Foundation depth would vary depending on local soil conditions. Foundations would be drilled using a truck-mounted drill and then filled with concrete. The meteorological towers would be anchored with guy wires.

Other facilities requiring foundations would include transformer pads, the substation, and the O&M building. These foundations would be constructed using standard cut-and-fill procedures and pouring concrete in a shallow slab or using a precast structure set on an appropriate depth of structural fill.

2.2.2.3 Trenching and Placement of Underground Electrical and Communications Cables

Underground electrical and communications cables would be placed in approximately 2- to 4-ft wide trenches along the length of each turbine string corridor. In some cases, trenches would run from the end of one string to the end of an adjacent string to connect more turbines together via the underground network. Trenches would be excavated to below frostline and electric distribution and communications cables would be placed in the trench using trucks. Electrical cables would be installed first and the trench would be partially backfilled prior to placement of the communications cables. Trenches would be backfilled and the area revegetated concurrently with revegetation of other construction areas. An estimated 87 transformers would be used to step up low voltage power to 34.5 kV and approximately 54 mi of underground power cable would be installed.

2.2.2.4 Overhead Electrical Power and Communication System

Most of the project's electrical and communications systems would be installed underground. About 1.0 mi of overhead collection lines may be installed near the substation to connect the wind project to the substation. These would be installed along existing county roads. All overhead collection lines would be installed in conformance with Western's standards, the

National Electric Safety Code, the American National Standards Institute, and *Suggested Practices for Raptor Protection on Power Lines - The State of the Art in 1996* (Avian Power Line Interaction Committee 1996). Wooden poles with 45- to 55-ft installed height would be erected to the substation. Temporary disturbance width would average 20 ft and all disturbance would be confined to a 50-ft easement.

2.2.2.5 Installation of FAA-required Lights

Federal Aviation Administration (FAA)-required lights would be installed on the nacelle prior to lifting the nacelle onto the turbine tower. Power to the lights would typically be provided by the turbine; when turbines are not generating power, power to the lights would be provided by the existing grid.

2.2.2.6 Substation and O&M Building Construction

A substation would be constructed on private land at the junction of the wind plant power line and Western's 230-kV transmission line. The substation would house transformers and other facilities to step up medium voltage power from the wind project's 34.5-kV power lines to high voltage for delivery to the 230-kV transmission line. The substation would be similar to substations typically used on transmission systems in the region and would be less than 10 acres in size. Small concrete foundations would be constructed for transformers and other components within the substation, but the majority of the yard would be covered with crushed rock. Crushed rock, sand, and gravel would be obtained from existing permitted sources. The substation would be fenced with a 7.0-ft high chain-link fence topped with three strands of barbed wire, for a total fence height of 8.0 ft. Access gates would be locked at all times and warning signs would be posted for public safety.

The O&M building would be constructed adjacent to the substation and within the fenced area. It would consist of a tan metal building approximately 30 ft wide x 50 ft long. The prefabricated building would be installed on a concrete slab and would be wired for electricity to run lights

and power tools. The O&M building would likely contain a simple plumbing system, in which fresh water is trucked in and stored in a cistern, and used water is stored in holding tanks and then disposed of at an approved off-site facility. Alternatively, SCE may opt to construct a septic system. Any septic system would be constructed in conformance with state and county regulations and permitted accordingly.

2.2.2.7 Final Testing

Final testing would involve mechanical, electrical, and communications inspections to ensure that all systems are working properly. Performance testing would be conducted by qualified windpower technicians and would include checks of each wind turbine and the control system prior to final turbine tower and meteorological tower commissioning. Electrical tests of the wind project components (i.e., turbines, transformers, and collection systems) and the substation would be performed by qualified electricians to ensure that all electrical equipment is operational within industry and manufacturer's tolerances and is installed in accordance with design specifications. All installations and inspections would be in compliance with applicable codes and standards (Table 2.3).

2.2.2.8 Final Road Grading, Erosion Control, and Site Clean-up

During final road grading, surface flows would be directed away from cut-and-fill slopes and into ditches that outlet to natural drainages. SCE would be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) as required by the U.S. Environmental Protection Agency (EPA), and the plan would include standard sediment control devices (e.g., silt fences, straw bales, netting, soil stabilizers, check dams) to minimize soil erosion during and after construction. SCE or their agents would rent dumpsters from a local sanitation company to collect and dispose of waste materials. Following construction, SCE would ensure that all unused construction materials and waste are picked up and removed from the project area. SCE would hire a contractor to provide an adequate number of portable toilets in the project area

Table 2.3 Applicable Electrical Codes, Standards, and References.

- National Electrical Safety Code (NESC)
- National Electrical Manufacturer's Association (NEMA)
- American Society for Testing and Materials (ASTM)
- Institute for Electrical and Electronic Engineers (IEEE)
- National Electrical Testing Association (NETA)
- American National Standards Institute (ANSI)
- State and Local Codes and Ordinances
- Insulated Power Cables Engineers Association (IPCEA)
- Occupational Safety and Health Administration (OSHA) Part 1910, Subpart S, 1910.308.

during construction and would ensure that sanitary wastes would be removed and disposed of at an approved facility in accordance with state and local laws.

Contractors would provide trash barrels or dumpsters to collect construction trash, lunch wrappers, etc., and these solid wastes would be routinely removed and disposed of at an approved facility. No waste disposal by incineration would occur. The O&M building would be used to store parts and equipment need for O&M. While SCE does not anticipate the use of any liquid chemicals within the project area, SCE will inspect and clean up the project area following construction to ensure that no solid (e.g., trash) or liquid wastes (e.g., used oil, fuel, turbine lubricating fluid) were inadvertently spilled or left on-site. A final site cleanup would be made in conjunction with construction site reclamation.

Cleanup crews would patrol construction sites on a regular basis to remove litter. A final site cleanup would be made prior to shifting responsibilities to O&M crews. O&M crews would continue to use dumpsters for daily maintenance.

2.2.3 Public Access and Safety

Public access to private lands is already restricted by landowners and would continue to be restricted in accordance with easement agreements. The substation and O&M building would be fenced as required for public safety, but no other fencing is proposed at this time.

The FAA typically requires every structure taller than 200 ft above ground level to be lighted, but in the case of wind power developments, it will allow a strategic lighting plan that provides complete conspicuity to aviators but does not require lighting every turbine. SCE is developing a lighting plan to be submitted for FAA approval. An estimated 20-25% of the project's turbines would be designated for lighting with medium intensity dual red synchronously flashing night-time lights and either no daytime lights or white strobe daytime lights.

All fires would be extinguished immediately by SCE personnel, if there is no danger to life or personal safety, and the appropriate landowner and the county sheriff's department would be notified immediately. Some fire-fighting equipment would be located in vehicles and in the O&M building. If the fire cannot be extinguished by SCE personnel, the landowner and sheriff would be so advised. Fire deterrents within the wind project would include access roads, which may serve as fire breaks and regular clearing of vegetation from areas around transformers, riser poles, and the substation.

Safety signing would be posted around all towers (where necessary), transformers, and other high-voltage facilities, and along roads, in conformance with applicable state and Federal regulations.

2.2.4 Operations and Maintenance

SCE would operate and maintain the wind project. All turbines, collection and communications lines, substations, and transmission lines would be operated in a safe manner according to standard industry operation procedures. Routine maintenance of the turbines would be necessary

to maximize performance and detect potential difficulties. Each turbine would be remotely scanned by computer every day to ensure operations are proceeding efficiently. Any problems would be promptly reported to on-site O&M personnel, who would perform both routine maintenance and most major repairs. Most servicing would be performed up-tower, without using a crane to remove the turbine from the tower. Additionally, all roads, pads, and trenched areas would be regularly inspected and maintained to minimize erosion.

Access roads will be maintained during O&M to prevent off-road detours due to ruts, mud holes, landslides, etc. Roads would be maintained as needed; it is anticipated that maintenance would occur twice per year but more frequent maintenance would be performed, if needed, to maintain roads in an condition acceptable to the county (for county roads) and to the landowner (for private roads). All fuels and/or hazardous materials will be properly stored during transportation and at the job site. Workers will be instructed to keep all job sites in a sanitary and safe condition. Workers will be expected to respect the property rights of private landowners.

2.2.5 Work Force

Construction of the 130-MW project would require approximately 20 people per day for 180 days. Substation construction would require approximately 5 people for 90 days. Reclamation would require about 4 people for 30 days. Construction crews would likely work 10- or 12-hour work days, 6 days per week. Phase I construction would require about half this number. Most Phase I construction work would be completed during a 5-month construction period in 2005. Construction of subsequent phases would occur as Power Purchase Agreements are obtained. O&M would require an estimated 8-10 full-time personnel.

2.2.6 Traffic

Construction of wind project facilities would occur simultaneously, using single vehicles for multiple tasks. The average number of daily vehicle trips to the site would be about 15 vehicles, while the number of vehicles actually working on-site would be about 20. During normal O&M,

daily traffic to and on the site would include one or two four-wheel drive pickups. During both construction and O&M, SCE or its contractors will use water, as necessary, to control dust from traffic. Snow removal equipment (trucks equipped with wing-style blades) would be utilized as needed during winter.

2.2.7 Water Use

On average, the project, once completed, would use an estimated 0.2 acre-ft of water per year (Table 2.4). Water for construction and dust control would be obtained from permitted commercial or municipal sources such as Peetz or Sterling, Colorado, or Sidney, Nebraska, or local batch plants. For construction of the 130-MW project, an estimated 765,085 gallons of water would be used to mix concrete for turbine footings and substation foundation, for dust control, and for compaction. An estimated 754,377 gallons of this amount would be consumed in concrete for turbine foundations and 10,708 gallons would be used to construct the substation. An estimated 761,250 gallons would be used for road construction. An estimated 32,625 gallons (approximately 0.1 acre-ft) per year would be used for dust control for the 40 year operational life-of-project.

Table 2.4 Estimated Water Use Per Year and for the Life-of-Project.

Construction	Yards of Concrete/Facility	Gal/yd	Gal/Facility	No. Facilities	Total Gal
Turbines	299	29	8,671	87	754,377
Substation	292	29	8,468	1	8,468
Soil compaction (substation)					2,240
Roads	7,612.5 gal/day for 20 days/month for 5 months				761,250
Total water used during construction					1,526,335
Operation					
Water for dust suppression	32,625 gal/yr for 39 years of operation				1,272,375
Totals and Averages					
Total used for the 40-year life-of-project (Construction and operation)					2,798,710
Average water use/yr					69,968
Average water use/yr in acre-ft					~0.2

An estimated 1,526,335 gallons (approximately 4.7 acre-ft) of water would be consumed during construction of the 130-MW project. During the 39-year operation period, an additional 1,272,375 gallons (3.9 acre-ft) would be consumed. Total water usage over the 40-year life-of-project would be 2,798,375 gallons, so an average of 69,968 gallons (approximately 0.2 acre-ft) per year would be consumed.

2.2.8 Hazardous Materials

The only hazardous chemicals anticipated to be on-site are the chemicals contained in diesel fuel, gasoline, coolant (ethylene glycol), and lubricants in machinery. SCE and its contractors would comply with all applicable hazardous material laws and regulations existing or hereafter enacted or promulgated regarding these chemicals and would implement a Spill Prevention, Control, and Countermeasure Plan (SPCCP), as necessary. Hazardous chemicals contained in diesel fuel, gasoline, coolant (ethylene glycol), and lubricants would not be stored in Spring Canyon (the project area's only floodplain; see Section 3.4.1), nor would any vehicle refueling or routine maintenance occur in Spring Canyon. When work is conducted in and adjacent to Spring Canyon, fuels and coolants would be contained in the fuel tanks and radiators of vehicles or other equipment, so the chance of a spill would be negligible.

2.2.9 Reclamation and Abandonment

Reclamation would be conducted on all disturbed areas to comply with easement agreements. The short-term goal of reclamation would be to stabilize disturbed areas as rapidly as possible, thereby protecting sites and adjacent undisturbed areas from degradation. The long-term goal would be to return the land to approximate pre-disturbance conditions.

After construction is complete, temporary work areas would be graded to the approximate original contour and the area would be revegetated with approved seed mixtures. SCE would consult with the Natural Resources Conservation Service (NRCS) on appropriate reclamation methods and seed mixtures and would obtain approval from landowners to implement the

appropriate practices. Most post-construction work would entail stabilizing slopes; scarifying soils to reduce compaction; and reseeding unused disturbed areas including portions of turbine pads not required for O&M, road cuts-and-fills, underground power line trenches, and overhead power line routes. Approximately 69% of new disturbance would be reclaimed upon construction completion.

At the end of the project's useful life (about 40 years), SCE would obtain any necessary authorization from the appropriate regulatory agency or landowner to abandon the wind project. Turbines, towers, and transformers would be removed and recycled or disposed of at approved facilities. Foundations would be abandoned in place to a depth of 3 to 4 ft below grade. All private project roads would revert to landowner control. Underground power and communication lines would be abandoned in place; overhead power lines and poles would be removed. Reclamation procedures would be based on site-specific requirements and techniques commonly employed at the time the area is to be reclaimed and would include regrading, topsoiling, and revegetation of all disturbed areas. This EA does not address the potential that the project could be repowered (i.e., new or refurbished turbines could be installed after the life-of-project). Additional environmental analysis and permitting would be required if the site is not abandoned as currently proposed.

2.2.10 Western's Standard Construction, Operation, and Maintenance Practices

SCE proposes to implement Western's standard construction, operation, and maintenance practices, where applicable, to avoid and minimize impacts to the environment to the extent practicable (Table 2.5). These measures are part of SCE's proposed project and Western's Proposed Action and are considered in this EA's impact analysis.

2.2.11 Applicant-committed Mitigation Measures

SCE also proposes to implement the following mitigation measures to avoid, reduce, or eliminate project impacts related to SCE’s Proposed Action. These mitigation measures may be waived on

Table 2.5 Western's Standard Construction, Operation, and Maintenance Practices.

1. The contractor shall limit the movement of crews and equipment to the ROW, including access routes. The contractor shall limit movement on the ROW to minimize damage to residential yards, grazing land, crops, orchards, and property, and shall avoid marring the lands. The contractor shall coordinate with the landowners to avoid impacting the normal function of irrigation devices during project construction and operation.

2. When weather and ground conditions permit, the contractor shall obliterate all construction-caused deep ruts that are hazardous to farming operations and to movement of equipment. Such ruts shall be leveled, filled and graded, or otherwise eliminated in an approved manner. Ruts, scars, and compacted soils in hay meadows, alfalfa fields, pastures, and cultivated productive lands shall have the soil loosened and leveled by scarifying, harrowing, discing, or other approved methods. Damage to ditches, tile drains, terraces, roads, and other features of the land shall be corrected. At the end of each construction season and before final acceptance of the work in these agricultural areas, all ruts shall be obliterated, and all trails and areas that are hard-packed as a result of construction operations shall be loosened and leveled. The land and facilities shall be restored as nearly as practicable to the original condition.

3. Water turnoff bars or small terraces shall be constructed across all ROW trails on hillsides to prevent water erosion and to facilitate natural revegetation on the trails.

4. The contractor shall comply with all Federal, state, and local environmental laws, orders and regulations. Prior to construction, all supervisory construction personnel will be instructed on the protection of cultural and ecological resources. To assist in this effort, the construction contract will address: a) Federal and state laws regarding antiquities and plants and wildlife, including collection and removal; and b) the importance of these resources and the purpose and necessity of protecting them.

5. The contractor shall exercise care to preserve the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent works, approved construction roads, or excavation operations, vegetation shall be preserved and shall be protected from damage by the contractor's construction operations and equipment.

6. On completion of the work, all work areas except access trails shall be scarified or left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion. All destruction, scarring, damage, or defacing of the landscape resulting from the contractor's operations shall be repaired by the contractor.

7. Construction trails not required for maintenance access shall be restored to the original contour and made impassable to vehicular traffic. The surfaces of such construction trails shall be scarified as needed to provide a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.

8. Construction staging areas shall be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. On abandonment, all storage and construction materials and debris shall be removed from the site. The area shall be regraded, as required, so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.

Table 2.5 (Continued)

9. Borrow pits shall be so excavated that water will not collect and stand therein. Before being abandoned, the sides of borrow pits shall be brought to stable slopes, with slope intersections shaped to carry the natural contour of adjacent, undisturbed terrain into the pit or borrow area, giving a natural appearance. Waste piles shall be shaped to provide a natural appearance.

10. Construction activities shall be performed by methods that prevent entrance or accidental spillage of solid matter, contaminants, debris, and other objectionable pollutants and wastes into flowing streams or dry water courses, lakes, and underground water sources. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, concrete, sanitary waste, industrial waste, radioactive substances, oil and other petroleum products, aggregate processing tailings, mineral salts, and thermal pollution.

11. Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or water courses will not be performed without prior approval from appropriate state agencies.

12. Excavated material or other construction materials shall not be stockpiled or deposited near or on stream banks, lake shorelines, or other water course perimeters where they can be washed away by high water or storm runoff or can in any way encroach upon the actual water source itself.

13. Waste waters from construction operations shall not enter streams, water courses, or other surface waters without use of such turbidity control methods as settling ponds, gravel-filter entrapment dikes, approved flocculating processes that are not harmful to fish, recirculation systems for washing of aggregates, or other approved methods. Any such waste waters discharged into surface waters shall be essentially free to settleable material. Settleable material is defined as that material that will settle from the water by gravity during a 1-hour quiescent period.

14. The contractor shall utilize such practicable methods and devices as are reasonably available to control, prevent, and otherwise minimize atmospheric emissions or discharges of air contaminants.

15. Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments or other inefficient operating conditions shall not be operated until corrective repairs or adjustments are made.

16. Burning or burying of waste materials on the ROW or at the construction site will not be allowed. The contractor shall remove all waste materials from the construction area. All materials resulting from the contractor's clearing operations shall be removed from the ROW.

17. The contractor shall make all necessary provisions in conformance with safety requirements for maintaining the flow of public traffic and shall conduct construction operations so as to offer the least possible obstruction and inconvenience to public traffic.

18. SCE will apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing a ROW, to the mutual satisfaction of the parties involved. SCE will install fence grounds on all fences that cross or are parallel to the proposed line.

19. The contractor will span riparian areas located along the ROW and avoid physical disturbance to riparian vegetation. Equipment and vehicles will not cross riparian areas on the ROW during construction and operation activities. Existing bridges or fords will be used to access the ROW on either side of riparian areas.

a case-by-case basis when deemed appropriate by Western after thorough analysis determines that the resource for which the measure was put in place would not be significantly impacted.

2.2.11.1 Fire Control

SCE would notify the appropriate landowners and the sheriff's office of any fires observed during construction. In the event of a fire, SCE or its contractors would initiate fire suppression actions in the work area. Suppression would continue until the fire is out or until the crew is relieved by an authorized representative of the landowner on whose land the fire occurred. Heavy equipment would not be used for fire suppression outside the project area without prior approval of the landowner unless there is imminent danger to life or property. SCE or its contractors would be responsible for all costs associated with the suppression of fires and the rehabilitation of fire damage resulting from its operations.

SCE would designate a representative to be in charge of fire control during construction. The fire representative would ensure that each construction crew has appropriate types and amounts of fire fighting tools and equipment, such as extinguishers, shovels, and axes available at all times. SCE would, at all times during construction and operation, require that satisfactory spark arresters be maintained on internal combustion engines.

2.2.11.2 Cultural Resources

Class III cultural resource inventories have been completed on all land proposed for surface disturbance and along crane paths (see Figure 2.1). SCE and its contractors would train their employees on relevant Federal regulations protecting cultural resources. Any cultural resource (historic or prehistoric site or object) discovered by SCE or any person working on its behalf would be immediately reported to Western. SCE would suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by Western. An evaluation of the discovery would be made by Western to determine appropriate actions to prevent the loss of significant cultural or scientific values. Western may consult with the State

Historic Preservation Office (SHPO) to determine NRHP eligibility or mitigation measures. SCE would be responsible for the cost of evaluation, and any decision as to proper mitigation measures would be made by Western after consulting with SCE.

2.2.11.3 Paleontologic Resources

Any paleontological resource discovered by SCE or any person working on its behalf would be immediately reported to the Colorado Geological Survey (CGS). SCE would suspend all operations within 100 ft of such discovery until written authorization to proceed is issued by the CGS. An evaluation of the discovery would be made by the CGS to determine appropriate actions to prevent the loss of significant scientific values. SCE would be responsible for the cost of evaluation, and any decision as to proper mitigation measures would be made by the CGS after consulting with SCE.

Construction personnel would be instructed about the types of fossils that may be encountered and the steps to take if fossils are discovered during construction. Instruction would stress the nonrenewable nature of paleontologic resources and that fossils are part of Colorado's prehistoric heritage and should be preserved for study.

2.2.11.4 Air Quality/Noise

All vehicles and construction equipment would be maintained to minimize exhaust emissions and would be properly muffled to minimize noise. Disturbed areas would be watered as necessary to suppress dust.

2.2.11.5 Vegetation

The following measures would be implemented to minimize impacts to vegetation.

- Surface disturbance would be limited to that which is necessary for safe and efficient construction.

- All surface-disturbed areas would be restored to the approximate original contour and reclaimed in accordance with easement agreements.
- Removal or disturbance of vegetation would be minimized through site management (e.g., by utilizing previously disturbed areas, designating limited equipment/materials storage yards and staging areas, scalping) and reclaiming all disturbed areas not required for operations.

2.2.11.6 Noxious Weeds

Noxious weeds would be mechanically controlled in all surface-disturbed areas. If herbicides are needed to control weeds, they would be applied by a licensed contractor. Equipment would be washed at a commercial facility prior to construction and on-site during construction if weeds are encountered in the project area.

2.2.11.7 Streams and Wetlands

SCE would comply with all Federal regulations concerning the crossing of WUS, as listed in Title 33 *Code of Federal Regulations* [C.F.R.] Part 323. No perennial streams or wetlands occur in the project footprint area (see Sections 3.3.1 and 3.4.1). The use of heavy equipment and other construction activities within 500 ft of ephemeral surface waters would be necessary. To minimize impacts from these activities, SCE would implement the following measures.

- Refueling and staging would occur at least 300 ft from the edge of a channel bank at all stream channels.
- Sediment control measures would be utilized.
- Vegetation disturbance would be limited to that which is necessary for construction.

2.2.11.8 Soils

The following measures would be implemented to minimize impacts to soils.

- No construction or routine maintenance activities would be conducted when soil is too wet to adequately support construction equipment (i.e., if such equipment creates ruts in excess of 4 inches deep).
- Certified weed-free straw mulches, certified weed-free hay bale barriers, silt fences, and water bars would be used to control soil erosion.
- Soil erosion control measures would be monitored, especially after storms, and would be repaired or replaced if needed.
- Surface disturbance would be limited to that which is necessary for safe and efficient construction.
- All surface-disturbed areas would be restored to the approximate original contour and reclaimed in accordance with easement agreements.
- Construction activities in areas of moderate to steep slopes (≥15-20%) would be avoided, where possible.

2.2.11.9 Wildlife

The following measures would be implemented to minimize impacts to wildlife.

- SCE would prohibit hunting, fishing, dogs, or possession of firearms by its employees and its designated contractor(s) in the project area during construction, operation, and maintenance.
- Surface disturbance would be avoided or minimized in areas of high wildlife value (e.g., prairie dog colonies and shelterbelts).
- SCE would advise project personnel regarding appropriate speed limits on roads to minimize wildlife mortality due to vehicle collisions. Potential increases in poaching would be minimized through employee and contractor education regarding wildlife laws. If violations are discovered, the offending employee or

contractor would be disciplined and may be dismissed by SCE and/or prosecuted by the Colorado Division of Wildlife (CDOW).

- Travel would be restricted to designated roads; no off-road travel would be allowed except in emergencies.

The following additional measures would be implemented to minimize impacts to raptors and other Federal- and state-listed threatened, endangered, proposed, and candidate (TEP&C) species or sensitive wildlife species.

- Western would consult and coordinate with FWS and CDOW for all mitigation activities related to raptors and species, TEP&C species, and their habitats.
- Raptor nest surveys would be conducted within a 1.0-mi radius of proposed construction areas during the raptor nesting season (January 1 through July 31) to determine nest location, activity status, and, if possible, species prior to construction.
- Surface occupancy and surface-disturbing activities would be prohibited as follows (Craig 2002):
  - golden eagle - no surface occupancy within 0.25 mi of nest; no construction within 0.25 mi of nest from January 1 to July 15;
  - ferruginous hawk - no surface occupancy within 0.5 mi of nest; no construction within 0.25 mi of nest from February 1 to July 15;
  - red-tailed hawk - no surface occupancy within 0.3 mi of nest; no construction within 0.3 mi of nest from February 15 to July 15;
  - Swainson's hawk - no surface occupancy within 0.25 mi of nest; no construction within 0.25 mi of nest from April 1 to July 15;
  - prairie falcon - no surface occupancy within 0.5 mi of nest; and
  - burrowing owl - no construction within 225 ft of nest from April 1 to July 31; in addition, SCE has committed to avoiding prairie dog colonies.

  Since the CDOW does not have specific avoidance buffers and dates for other owls, SCE would implement Western's standard 0.25 mi construction avoidance buffer for active nests (personal communication, May 2005, with John Bridges,

Western). If other species are found nesting in the project area, Western's standard buffer would be applied unless otherwise approved by Western. The buffer distance and restriction dates may vary on a case-by-case basis as determined by the FWS or CDOW, depending on such factors as the activity status of the nest, species involved, natural topographic barriers, line-of-sight distances, and other conflicting issues such as cultural values. Exceptions may be granted in writing by the FWS and/or CDOW.

- Additional mitigation for raptors would be designed on a site-specific basis, as necessary, in consultation with the FWS and CDOW. SCE would notify the FWS or CDOW immediately if raptors are found nesting on project facilities (i.e., power poles, towers).
- Power line construction would follow the recommendations of the Avian Power Line Interaction Committee (1996) to avoid electrocution of raptors and other avifauna.
- SEC would conduct post-construction mortality monitoring in accordance with National Wind Coordinating Committee recommendations until such time as Western determines that monitoring is no longer necessary. If unacceptable avian mortality occurs, as determined by Western, mitigation will be developed in accordance with current best management practices.

2.2.11.10 Federally Listed Threatened, Endangered, Proposed, and Candidate Species and State-listed Threatened and Endangered Species

The following mitigation measures would be implemented to minimize impacts to Federally listed TEP&C and state-listed threatened and endangered (T&E) species.

To minimize impacts to bald eagles, SCE would use state-of-the-art turbine technology, including unguyed, tubular towers and slow-rotating, upwind rotors. Overhead power lines would be constructed per the *Suggested Practices for Raptor Protection on Power Lines–the State of the Art in 1996* (Avian Power Line Interaction Committee 1996). SCE would also conduct a raptor nest inventory during the nesting season prior to construction to determine if

bald eagles are nesting within or near the project area. If any active bald eagle nests are discovered, the FWS would be consulted to identify appropriate mitigation. SCE would set and enforce speed limits and remove carrion from project roads to avoid collisions with bald eagles feeding on road-kill.

The other four Federally listed species--whooping crane, interior least tern, piping plover, and pallid sturgeon--occur on the Platte River downstream and the three bird species may occur in the project area during spring and fall migration. Minor surface water depletions (e.g., less than 25 acre-ft per year) are considered to adversely affect these species but mitigation is not required for minor depletions (see Appendix F). Mitigation measures for the protection of surface water quality would also assist to minimize water quality-related impacts to these species. SCE would use state-of-the-art unguyed turbines with tubular towers and slow-rotating rotors to minimize potential for collision-related mortality to whooping crane, interior least tern, and piping plover.

To minimize impacts to burrowing owl, ferruginous hawk, long-billed curlew, mountain plover, black-tailed prairie dog, northern pocket gopher, and swift fox, SCE would limit the surface-disturbed areas to that which is needed for safe and efficient construction, and all disturbed areas not needed for operation would be reclaimed as soon as possible after construction is complete. Additional mitigation for some of these species is presented below.

To minimize impacts to black-tailed prairie dogs, mountain plover, ferruginous hawk, and burrowing owl, all black-tailed prairie dog towns within the project area would be avoided.

Because mountain plover adults and broods may forage along roads used for operations and maintenance, particularly at dawn and dusk, traffic speed and volume would be limited during the breeding season (April 10-July 10).

A raptor nest inventory would be conducted during the nesting season prior to construction and if ferruginous hawks are found nesting within or near the project area, construction would be

sequenced to avoid construction activities within 0.25 mi of any active ferruginous hawk nest until the young have fledged or the nest has been abandoned/failed.

To minimize impacts to state-listed birds, SCE would use state-of-the-art turbine technology, including unguyed, tubular towers and slow-rotating, upwind rotors. Overhead power lines would be constructed per the *Suggested Practices for Raptor Protection on Power Lines–the State of the Art in 1996* (Avian Power Line Interaction Committee 1996). Surveys for mountain plover and burrowing owl would be conducted prior to construction, and construction would be sequenced to avoid occupied habitat (see Section 3.7.2.4).

2.2.11.11 Sanitation

Construction sites would be maintained in a sanitary condition at all times. Waste materials (e.g., human waste, trash, garbage, refuse) would be disposed of promptly at an appropriate waste disposal site. SCE and its contractors would prohibit littering in the project area.

2.2.11.12 Existing Utilities

SCE would notify other authorized easement users of any crossings or overlaps. Care would be used, including hand/shovel excavation where appropriate, for all construction work that parallels or crosses existing subsurface facilities (e.g., pipelines, cables, power lines).

2.2.11.13 Miscellaneous

Ditches and Culverts. All irrigation, overflow, and roadway ditches; lead-offs from culverts or cut sections; and lead-in ditches crossed by the project would be cleared of any material that may obstruct water flow. Work would be accomplished so that reasonable conformance to the previous line, grade, and cross section is achieved. If any culverts clog due to project activities, the culvert would be cleaned to provide an unobstructed flow to and through the culvert. Any loose material on the backslope adjacent to the entrance of the culverts would be removed.

Litter. Construction vehicles would be equipped with litter disposal containers. Contractors would be informed that any littering in the project area may result in their immediate dismissal. Garbage and other refuse would be disposed of at authorized disposal sites or landfills. Construction sites would be maintained in a sanitary condition at all times.

Stormwater Pollution Prevention Plan. SWPPPs would be prepared to ensure that erosion is minimized during storm events and they would be kept on-site at all construction sites, as well as in the construction contractors' offices.

Traffic and Public Safety. Construction and operation are not expected to cause safety hazards or to inconvenience motorists or other adjacent users because construction-related traffic would be restricted to existing roads and routes approved by private landowners. Temporary use permits for access to interstate, state, and county roads would be obtained prior to construction. No traffic-related or other public safety problems were encountered during construction of the existing wind project west of Peetz (personal communication, March 2005, with Roger Japp, Logan County Under Sheriff).

2.3 ALTERNATIVES CONSIDERED BUT REJECTED

Because this is a proponent-initiated project, and because the proponent has acquired or would acquire easements to the land needed to construct and operate with wind project, and because the project is in conformance with Western's mission and the President's national energy policy, no alternatives to the Proposed Action except the No Action Alternative were considered.

2.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, Western would not execute an interconnect agreement with SCE and the wind project would not be constructed.

A No Action decision would only be considered if one of the following conditions is met.

- If there were no acceptable means of mitigating significant adverse impacts to surface resource values, then this may trigger denial of the interconnect agreement and preparation of an environmental impact statement, unless the application is withdrawn by SCE.
- If the FWS concluded that the Proposed Action would likely jeopardize the continued existence of TEP&C species, then the interconnect agreement may be denied.

This EA will help determine whether the proposed project meets either of these conditions.

2.5 SUMMARY OF ENVIRONMENTAL IMPACTS

Table 2.6 presents a summary of environmental impacts and mitigation measures for the Proposed Action and the No Action Alternative. A detailed analysis of project impacts and mitigation measures is provided in Chapter 3.0.

Table 2.6 Summary of Environmental Consequences.

Resource	Possible Impacts from Proposed Action	Possible Impacts from No Action Alternative	Mitigation (includes mitigation measures discussed in Chapters 2.0 and 4.0)
Climate and air quality	Climate would not be impacted; temporary increases in fugitive dust during construction; long-term, minor increases in fugitive dust during O&M; beneficial impacts to air quality from generating electricity from a non-polluting resource	Loss of beneficial impacts to air quality from generating electricity from a non-polluting resource	Dust suppression during construction; proper maintenance of construction equipment; proper reclamation
Geology	No impacts to physiography; some life-of-project changes in topography due to cuts and fills; minor impacts to stream channels; no impacts from geologic hazards or mineral resources.	No impacts to physiography, topography, stream channels, geologic hazards, or mineral resources	Avoid steep slopes; proper reclamation
Paleontology	Possible inadvertent destruction of fossils during construction	No impacts	Preconstruction survey for fossils; if a site is discovered, halt construction and evaluate for significance; determine treatment as appropriate; employee education
Soils	Disturbance of 222 acres; LOP disturbance of 69 acres; some erosion and soil compaction	No impacts	Avoid areas with high erosion potential, where feasible; avoid activities when soils are too wet to support equipment; use of weed-free mulches, straw bales, silt fences, and water bars to control erosion; design and construct project roads properly; minimize disturbance; implement soil erosion practices until sites are permanently reclaimed; prompt stabilization and reclamation
Water resources	Some increased runoff and sediment would likely reach local drainages; accidental spills may occur; life-of-project consumption of 2,798,710 gallons of water; minor impacts to stream channels	No impacts	Avoid channel crossings and erosion-prone areas; cross channels at right angles; stabilize and reclaim promptly; appropriate road and turbine locate design and maintenance; locating refueling and staging areas at least 300 ft from streams; utilize sediment control measures; adhere to SWPPPs and SPCCPs
Floodplains and wetlands	No impacts	No impacts	No mitigation is warranted
Vegetation including noxious weeds	Initial disturbance of 222 acres of vegetation; life-of-project disturbance of 69 acres; potential for spread of non-native invasive species on surface-disturbed areas	No impacts	Minimize surface disturbance; manage construction sites; control noxious weeds; wash equipment; use weed-free seed mixtures and mulches; revegetate with native, adapted species; implement procedures to restore native prairie, including topsoil salvage and replacement

Table 2.6 (Continued)

Resource	Possible Impacts from Proposed Action	Possible Impacts from No Action Alternative	Mitigation (includes mitigation measures discussed in Chapters 2.0 and 4.0)
Wildlife and fisheries	Direct effects from collision-related mortality or electrocution; direct and indirect effects from 222 acres of temporary and 69 acres of life-of-project habitat loss; temporary displacement during construction; long-term displacement during operations; potential loss of breeding, nesting, and brood-rearing habitat; habitat fragmentation; inadvertent destruction of grassland bird nests; potential reduction in breeding and brood-rearing success; no impacts to fisheries	No impacts	Adhere to FWS guidelines, where practical; use state-of-the-art WTGs and wind industry standard practices; minimize noise; prohibit hunting, dogs, and possession of firearms by employees; set and enforce speed limits; limit traffic to designated roads; conduct raptor nest search and avoid activities in buffer around active nests; minimize disturbance; prompt reclamation, including restoration of shortgrass prairie; use best management practices to minimize erosion and harm from spills
Special status and sensitive species	Not likely to adversely affect bald eagles; may adversely affect species located downstream in the South Platte River; minor impacts to state-listed species; direct effects from collision-related mortality or electrocution; direct and indirect effects from 222 acres of temporary and 69 acres of life-of-project habitat loss; temporary displacement during construction; long-term displacement during operations; potential loss of breeding, nesting, and brood-rearing habitat; habitat fragmentation; inadvertent destruction of grassland bird nests; potential reduction in breeding and brood-rearing success.	No impacts	Adhere to FWS guidelines, where practical; use state-of-the-art turbines and wind industry standard practices; minimize noise; prohibit hunting, dogs, and possession of firearms by employees; set and enforce speed limits; limit traffic to designated roads; remove carrion from roads; conduct raptor nest and mountain plover searches and avoid activities in buffer around active nests; minimize disturbance; prompt reclamation, including restoration of shortgrass prairie; best management practices to minimize erosion and harm from spills; no mitigation is required for impacts to species located downstream in the South Platte River
Cultural resources	Some unidentified sites and artifacts may be disturbed or destroyed; beneficial impacts if significant cultural sites are discovered and recorded during construction	No impacts; potential loss of beneficial impacts.	If a site is discovered, halt construction and evaluate for eligibility to National Register of Historical Places; determine treatment as appropriate; employee education
Land use, transportation, and recreation	No change in landownership; loss of about 69 acres of cropland, rangeland, grazing land, wildlife habitat; and recreation; increased traffic and increased wear-and-tear on existing roads; beneficial additional land use of generating electricity from a renewable resource	No impacts	Project-related traffic yields to emergency vehicles and school buses; repair roads that are impacted by project activities; avoid heavy traffic when roads are too wet to bear traffic without creating ruts greater than 4 inches deep

Table 2.6 (Continued)

Resource	Possible Impacts from Proposed Action	Possible Impacts from No Action Alternative	Mitigation (includes mitigation measures discussed in Chapters 2.0 and 4.0)
Noise	Temporary short-term construction-related increases in noise; long-term turbine and substation noise and noise from O&M traffic	No impacts	Properly muffle all construction equipment; use state-of-the-art WTGs to reduce noise emissions; avoid noise-sensitive areas at critical times; use state-of-the-art turbines
Visual resources	Change in landscape due to presence of tall towers and rotating blades and flashing lights; presence of substation and project roads	No impacts	Use red pulsating lights for nighttime lighting and no lights during the day
Socioeconomics	Temporary beneficial economic impacts to local and state economies during construction; long-term benefits due to increased employment and tax base; no environmental justice concerns		Use local workers and contractors, where feasible; buy locally, where feasible
Hazardous materials	Possible spills		Implementation of appropriate spill prevention and control measures
Public health and safety	No impacts anticipated		Light turbiness in accordance with FAA requirements; fence high voltage facilities; maintain project area in sanitary condition at all times; prohibit littering; set and enforce speed limits; extinguish fires unless dangerous to life or limb

3.0 ENVIRONMENTAL ANALYSIS

Descriptions of the natural, human, and cultural environmental resources present in the project area are presented below by resource. For the purposes of this analysis, the project area for each resource includes all land within the project area boundary depicted on the maps unless otherwise noted. Direct and indirect impacts of the Proposed Action and the No Action Alternative are identified for each resource. Where mitigation above and beyond Western's standard mitigation measures are recommended, mitigation measures specific to the various resources are also discussed.

3.1 CLIMATE AND AIR QUALITY

3.1.1 Environmental Setting for the Proposed Project

3.1.1.1 Climate

The regional climate in the project area is semi-arid and continental, with warm (sometimes hot) dry summers and cold dry winters typical of the Great Plains (Amen et al. 1977). Average maximum temperatures at Sterling (25 mi south of the site) are highest in July (90.1ºF) and lowest in January (39.0ºF) (Table 3.1) (Western Regional Climate Center [WRCC] 2004). Average minimum temperatures are also highest in July (59.2ºF) and lowest in January (11.2ºF). Monthly precipitation at Sterling ranges from a low of 0.28 inches in February to a high of 2.78 inches in May (see Table 3.1). Annual precipitation averages 15.27 inches (WRCC 2004), most of which falls during the growing season (U.S. Forest Service 1997). Annual snowfall averages 20.5 inches. Snowfall can occur 9 months of the year, with highest snowfalls in January (4.0 inches) and least (of the 9 months) in May (0.1 inch); since 1948, no snow has been recorded in June, July, or August. Average snow depth December through February is 1.0 inch.

The site is located in a Class IV wind area (National Renewable Energy Laboratory 2004); Class IV areas are defined as having good wind power development potential. Wind speeds at 164 ft above the ground average 16.6 to 17.7 mph. Prevailing winds are from the northwest (Figure 3.1).

Table 3.1 Period of Record Monthly Climate Summary for Sterling, Colorado.

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Average max. temperature	39.0	45.3	52.2	62.6	72.3	83.3	90.1	88.1	78.7	66.7	50.9	41.2	64.2
Average min. temperature	11.2	16.7	23.6	33.4	44.2	53.7	59.2	57.0	46.3	33.8	22.0	13.7	34.6
Average total precipitation (inches)	0.31	0.28	0.86	1.22	2.78	2.73	2.55	1.75	1.10	0.89	0.50	0.29	15.27
Average total snow fall (inches)	4.0	3.0	4.2	2.0	0.1	0.0	0.0	0.0	0.2	0.2	3.3	3.3	20.5
Average snow depth (inches)	1	1	0	0	0	0	0	0	0	0	0	1	0

[1] Source: WRCC (2004).

3.1.1.2 Air Quality

The Pawnee National Grassland, located about 25 mi west of the site, is within the Front Range airshed (U.S. Forest Service 1997), and since there are no physical barriers between the grasslands and the project area, it is assumed that the project area is within the same airshed. Air quality in the Front Range is designated as attainment for all criteria pollutants, sulfur dioxides, nitrogen oxides, particulate matter, and ozone. Mobile and area sources from Front Range urban areas may impact the more rural areas in eastern Colorado. Other pollutant sources include the nine large power plants that operate within the airshed (personal communication, January 2005, with Francisco Escobedo, U.S. Forest Service, Pawnee National Grassland), oil and gas development, urbanization, agricultural activities, prescribed burning, dust and particulate emissions from roads, tailpipe emissions, and off-road vehicle traffic.

3.1.2 Environmental Impacts and Mitigation Measures

3.1.2.1 Significance Criteria

Impacts to air quality would be considered significant if emissions from construction would violate any state or Federal air quality standards.

3.1.2.2 Impacts of the Proposed Project

Climate would not be impacted by the proposed project (Keith et al. 2004).

Possible adverse impacts to air quality would occur during construction and operation due to short-term increases in particulates (e.g., dust from excavation and vehicle traffic) and tailpipe emissions from construction and operations vehicles.

During operation, using wind power instead of burning fossil fuels to generate electricity would have beneficial impacts on air quality because greenhouse gases and other pollutants emitted by conventional fossil fuel combustion would not be produced. The term "beneficial" is used to describe the favorable impact of using a nonpolluting resource to generate electricity; it does not reflect any proactive clean-up to improve air quality. Operation also would result in small amounts of dust and tailpipe emissions from O&M vehicle traffic.

It is not anticipated that any state or Federal air quality standards would be exceeded due to the construction or operation of the project and potential adverse impacts to air quality would not be significant. The project is expected to be in compliance with National Ambient Air Quality Standards.

3.1.2.3 Impacts of the No Action Alternative

Under the No Action Alternative, no dust or tailpipe emissions would occur due to project construction or operation. Conversely, the opportunity to generate electricity using a non-polluting resource would be lost.

3.1.2.4 Mitigation Measures

Mitigation for impacts to air quality would include the following:

- dust abatement techniques (e.g., spraying water) would be used on unpaved and unvegetated surfaces to minimize dust emissions;
- SCE and its contractors would post and enforce a speed limit of 25 mph on roads developed for the project to reduce fugitive dust emissions from traffic;
- disturbed soils or construction material (e.g., concrete) would be covered if they become a source of fugitive dust;
- areas to be blasted would be covered with blast mats; and
- disturbed areas would be reclaimed and revegetated as soon as possible after construction.

3.2 GEOLOGY, PALEONTOLOGY, AND SOILS

3.2.1 Environmental Setting for the Proposed Project

3.2.1.1 Geology

The major physiographic feature in the area is Peetz Table, a large gently sloping plateau that rises several hundred feet from the plains to the south. The majority of the project area is flat to gently sloping; the southern portion is rolling. The only dissected area is in Sections 31 and 32, T12N, R50W, at the head of Spring Canyon. The project area is underlain by the Ogallala, Arikaree, and White River Formations (Tweto 1979) (Figure 3.2).

The area has low seismic potential and no earthquakes have occurred in the area historically (Colorado Geological Survey 2002). No sand dunes occur in the project area. The steep slopes along Spring Canyon may be subject to slides, but most of the project area is relatively flat to rolling (Amen et al. 1977) so landslide potential is low. Abandoned caliche quarries occur in the project area, but no underground mining occurred, and thus there is no potential for mining-related ground subsidence. Sink holes or other underground features that could cause subsidence are not known to occur in the project area. Project facilities would not be located in floodplains (see Figure 3.7).

The only mineral known to occur in the project area is caliche, which was quarried in the past but is not currently being recovered. No oil, gas, or coal fields occur in the project area (Smith et al. 1991, Tremain et al. 1996). The project area is within a region known to contain other industrial minerals (e.g., clay, sand, and gravel) (U.S. Geological Survey 1968), but none are actively mined in the project area.

3.2.1.2 Paleontology

Ogallala Formation. The Ogallala Formation is a fluvial deposit locally subdivided into an upper and lower unit. Only the upper unit occurs in the project area. This unit, which varies from 40 to 450 ft thick, underlies Peetz Table and is considered equivalent to the Ash Hollow Member of the Ogallala Formation as described by Condra and Reed (1959). The upper part of the upper unit contains a pale red or very pale orange dense pisolitic caliche layer or limestone that is locally brecciated and recemented and crops out as a bench-forming caprock that is about 2 ft thick. In nearby Nebraska, this and some underlying beds are called the Kimball Member of the Ogallala Formation. The Ash Hollow Member forms erosion-resistant ledges and is characterized by mortar beds, grayish-orange–pink pebbly sand, and silt firmly cemented by calcium carbonate or, locally, opal. Unconsolidated gravels included in the member consist of rounded clasts of granitic, sedimentary, and volcanic rocks. Layers of light-brown and yellowish-gray silt beds of silver-gray, biotite-rich volcanic ash also occur in the upper part. As

described below, Tedford (1999) included a fluvial deposit that underlies the rocks of the Ogallala (as mapped by Scott [1978]) and truncates older deposits in the Ogallala Formation.

Arikaree Formation: In the project area, the Arikaree Formation as mapped by Scott (1978) includes fluvial deposits equivalent to the Marsland Formation of Schultz (1938) and Arikaree Formation as described by Wilson (1960). In his mapping, Scott indicated that he included only rocks of the Martin Canyon beds (rocks that yield fossils of the Martin Canyon local fauna) in the Arikaree Formation. These deposits include between 20 and 150 ft of chiefly gray to brown moderately consolidated conglomerate, sandstone, siltstone, and claystone and minor amounts of gravel and sand. They typically form rubble of biotite-rich, ashy, calcareous siltstone nodules that are dominantly oval. This rubble is usually developed at the top of the formation but can occur anywhere in the formation. Gravel within the formation is cross-stratified and contains clasts of siltstone, quartz, feldspar, and plutonic and volcanic rocks as large as 10 inches. Sand is fine to coarse, loose to friable, and cross-stratified, and commonly occupies channels cut into the next lower bed or into underlying beds of the White River Group.

The cut-and-fill nature of the Arikaree Formation and related formations (Pawnee Creek) make stratigraphic relationships complicated. For example, Galbreath (1953) included the Martin Canyon beds (which Scott mapped as the Arikaree Formation) in the Pawnee Creek Formation. Tedford et al. (1987) noted that the Martin Canyon beds underlie the Pawnee Creek Formation and are separated from that formation by a major disconformity. This would make the Pawnee Creek Formation a separate and younger valley fill deposit. As conceived by Tedford et al. (1987), the Pawnee Creek Formation consists of tuffaceous silty sandstones showing complex cut-and-fill structures and contains conglomerate lenses and abundant lenticular vitric tuffs. At its type area, the Pawnee Creek Formation (minus the gravels removed from inclusion in the formation by Tedford et al. [1987]) fills the course of a single river valley that occupies a sinuous course through the Pawnee Buttes area of Colorado. Dated ash beds in that area document that the Pawnee Creek Formation accumulated between about 14.0 and 14.5 million years ago (Tedford 1999). These deposits and their abundant fossil fauna are of particular scientific significance because they fill an important hiatus in the classic Nebraska sequence.

In some places in Logan County, a younger fluvial deposit cuts through the underlying Pawnee Creek Formation, truncating it and the underlying Martin Canyon beds to rest unconformably on the White River Group (Figure 3.3). Tedford et al. (1987) amended the definition of the Pawnee Creek Formation as originally proposed by Galbreath (1953) in Weld County, Colorado, and removed similar gravels from the formation definition and referred them instead to the overlying Ogallala Formation. It is unclear if the gravels in Logan County are the same as those removed from the Pawnee Creek Formation by Tedford et al. (1987). It is also unclear if the rocks included by Scott (1978) in the Arikaree Formation are referable to the Martin Canyon beds or the Pawnee Creek or Ogallala Formations or if they represent a separate unnamed unit. The relatively younger age of the Ogallala Formation (as shown by fossils in the Wray, Colorado, area) strongly suggests that this unnamed unit represents a separate fluvial deposit of

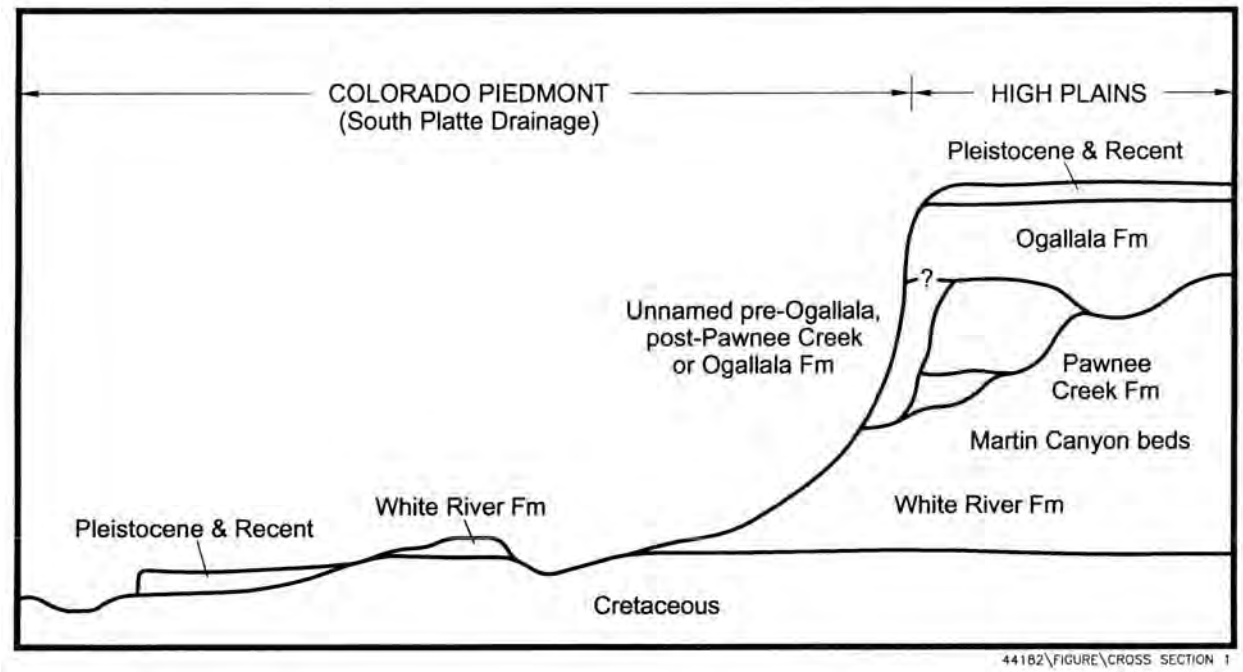

Figure 3.3 Schematic Cross Section of Beds in Logan County, Colorado, Between the South Platte River and the Northern Boundary of the State (Modified from Galbreath [1953]). Martin Canyon Beds Occur Below the Pawnee Creek Formation = Arikaree Formation of Scott (1978.)

pre-Ogallala, post-Pawnee Creek age (Figures 3.4 and 3.5). The name Arikaree Formation as applied by Scott (1978) should probably be abandoned in favor of the Pawnee Creek Formation in Logan County, Colorado.

White River Group. Scott (1978) mapped the upper part of the White River Group along Peetz Table as the Brule Formation. These same deposits have been called the Vista Member and Cedar Creek Beds of White River Formation by Galbreath (1953) and Matthew (1901), respectively. The Brule Formation is predominantly gray to pale-brown or reddish-brown sandy to slightly clayey and ashy mica-bearing siltstone. The siltstone ranges from soft and plastic to hard and blocky. The upper part is equivalent to the Whitney Member of Schultz and Stout (1938) and contains small calcareous nodules. A little lower in the section is a white calcareous marker horizon that forms a conspicuous band on the south edge of Peetz Table. The remainder of the Brule Formation underlying this band consists of a thick lenticular pale-red or reddish-brown crossbedded friable, pebbly, cobbly, hard, micaceous channel-form sandstone and siltstone sequence that contain siltstone clasts and granitic gravel. These deposits are thought to be equivalent to the Orella Member of the Brule Formation as described by Schultz and Stout (1938).

History of Vertebrate Paleontological Investigations. The history of vertebrate paleontological investigations into the Tertiary beds of northeastern Colorado up until the late 1950s is summarized by Galbreath (1953). Additional paleontological work through the mid 1980s is summarized by Tedford et al. (1987, 2004). From these accounts, the first vertebrate paleontologist to work in this area was O.C. Marsh, who in the summer of 1870, noted the occurrence of "*Titanotherium* beds" along the Chalk Bluffs in western Weld County, along with overlying beds of the White River Group. Marsh noted that the White River Formation was marked by the abundant fossil remains of oreodonts. Marsh's protagonist, E.D. Cope, visited the region in 1873 and again in 1879 and noted the general similarity of the Tertiary beds of northeastern Colorado to those in Nebraska and South Dakota. In 1874, Cope published a major work on the results of his expeditions. In 1898, 1901, and 1902, field parties from the American

Museum of Natural History (AMNH) led by Matthew, Brown, and Thomson explored Logan and Weld Counties (Osborn 1918). The second and last major work published on the region (Matthew 1901) resulted from these expeditions.

Subsequent to the work by the AMNH and through the 1930s, field parties from the Denver Museum of Natural History (now Denver Museum of Natural Science [DMNS]), University of California, Childs Frick, and University of Kansas collected fossil vertebrates from the region. In 1940, Dr. G. Edward Lewis, with the U.S. Geological Survey (USGS) in Denver, and Dr. Robert W. Wilson began intensive work in the area that was interrupted by World War II. In 1946, Dr. C.W. Hibbard led a field party from the University of Kansas. In 1958, E.C. Galbreath published the results of his studies, which remains the most comprehensive work on the region to date. Tedford et al. (1987, 2004) and Tedford (1999) summarized the biostratigraphic implications of the late Oligocene to Pliocene rocks of northeastern Colorado.

The Ogallala Formation (Ash Hollow) rocks that cap the local geologic section in Logan County are traceable to the east, where they occur as outcrops along the Republican River near Wray in Yuma County, Colorado. There, Cook (1922a, 1922b) reported the presence of fossil vertebrates of early Hemphillian age (see Figure 3.5) comparable to fossils from localities in nearby Nebraska.

Tedford (1999) and Tedford et al. (2004) removed the upper gravels from the type section of the Pawnee Creek Formation and included them instead in the overlying Ogallala Formation; however, these deposits that yield fossil vertebrates that comprise the Kennesaw, Vim-Peetz, and Sand Canyon local faunas (see Figure 3.5) (Galbreath 1953) appear to be significantly older than those found at Wray, Colorado. It is more likely that these fluvial gravels represent an unnamed formation that pre-dates the Ogallala Formation and post-dates the Pawnee Creek Formation. These unnamed deposits yield fossils of insectivores, shrews, rodents, mustelids, canids, elephants, horses, rhinos, and oreodonts.

Fossil vertebrates from the Pawnee Creek Formation include specimens from several localities collectively referred to as the Eubanks fauna (near the base of the formation) by Galbreath (1953) and Keota fauna from higher in the formation (Tedford 1999) (see Figure 3.5). Fossils from lower in the formation include beavers, horses, rhinos, oreodonts, camels, canids, amphicyons, and deer. Fossil vertebrates from the upper part of the formation include the first elephants in North America that represent both mammutids and gomphotheriids.

Fossil vertebrates from the Martin Canyon beds (see Figure 3.5) are significantly older than those from the overlying Pawnee Creek. This observation supports the presence of a major disconformity within the Pawnee Creek Formation as previously defined. Thus, the Martin Canyon beds represent a separate, older fluvial deposit that should not be included in the Pawnee Creek Formation. Fossils from the Martin Canyon beds include shrews, moles, rabbits, rodents, canids, horses, rhinos, peccaries, oreodonts, camels, and deer.

Fossil vertebrates from the Vista Member of the White River Formation (see Figure 3.5) include marsupials, shrews, rabbits, rodents, horses, oreodonts, camels, and hypertragulids, and primitive deer.

In 1979, the Colorado Scientific Society conducted a spring field trip to study the geology and paleontology in the Sterling, Colorado, area. The trip was led by Glenn Scott, Ed Lewis, and Norm Denson. The trip made stops at several fossil vertebrate localities in the White River (Brule), Arikaree, and Ogallala Formations in the vicinity of the project area. These included the following:

- Brule Formation in T11N, R52W-R53W, at a locality where it was noted that the remains of the camel *Leptauchenia*, artiodactyl *Leptomeryx*, rabbit *Palaeolagus*, and rodent *Paradjidaumo* were collected;
- Arikaree Formation in T11N, R53W, at a locality where remains of the oreodont *Merycochoerus* were collected; and
- Ogallala Formation in T11N, R52W-R53W, at a locality where remains of the horse *Merychippis*, camel *Alticamelus*, and rodent *Mylagaulus* were collected; and at

another locality in T11N, R52W, where fragments of rhino and tooth and bone fragments of an unidentified artiodactyl where collected.

An online catalogue of AMNH (2004) fossil localities noted fossils collected in the Pawnee Creek Formation in Logan County during the 1901 survey described earlier, including the following localities and specimens of tortoise:

- AMNH 11043 - a nearly complete shell of subadult *Geochelone osborniana* (a tortoise);
- AMNH 11044 - nearly complete shell of *Geochelone osborniana*;
- AMNH 11045 - two subadult shells of *Geochelone osborniana*;
- AMNH 11046 - five shells of *Geochelone osborniana* (three collected, others weathered and broken), another shell of *Geochelone osborniana* with postcranial bones, and a 15-inch shell of *Stylemys*;
- AMNH 11048 - a very large shell of *Geochelone osborniana*;
- AMNH 12422 - a skull and shell of *Geochelone osborniana* (holotype), skull and limb bones of *Geochelone pansa* (holotype), and postcranial bones of *Testudo* sp.; and
- AMNH 12432 - toe and dermal bones of *Testudo* sp.

Unfortunately, in 1901, poor locality records were kept and the exact locations of these sites within Logan County are unknown.

Paleontology within the Project Area. Search of records of the Colorado University (CU) Museum (Culver 2004) and DMNS (Ivy 2004) did not reveal any fossil localities within the townships encompassed by the project area. Culver (2004) noted, however, that the CU Museum had many localities in the White River Group and Arikaree Formation in neighboring townships to the west. The Museum of Paleontology at Berkeley has yet to respond to the locality search request.

The absence of known fossils in the Ogallala and Arikaree Formations and White River Group within the project area may be due to the following:

- absence of outcrops,
- absence of fossils in outcrops, or
- lack of work in the area by paleontologists.

It is unknown which of these, or what combination of these three factors, is responsible for the lack of known fossils and fossil localities in the project area.

Based on the literature, and in the absence of specific field data about outcrops in the project area, the Ogallala Formation, Arikaree Formation (which probably includes Pawnee Creek Formation and unnamed younger deposits), and White River Group have a high potential to contain fossils of scientific significance. These deposits and their abundant fossil fauna are of particular scientific significance because they fill an important hiatus in the classic Nebraska sequence.

On March 3 and 4, 2005, a field reconnaissance of the project area was conducted to determine the nature and extent of paleontological resources of potentially impacted areas within the project boundaries.

Few areas of rock outcrop occur in the project area. Exposures along the margins of the Peetz Table escarpment are very poor, and the top of the tableland is marked by alluvial terrace gravels and thin, loess-rich soils and no outcrops. The top of the Peetz Table varies from essentially flat to undulating, and the crests of most hills or rises forming the top of the tableland show exposures of weathered sediments of the Ogallala Formation.

The only well-exposed rock within the project area belongs to the Ogallala Formation where it is exposed in a few steep cliffs along Spring Creek Canyon. These and other Ogallala exposures were examined for the remains of fossil vertebrates. A few bone fragments, possibly the remains of the shaft of a tibia of an unknown artiodactyl were discovered in the SWNWSE, Section 32, T12N, R50W. The bone is so poorly preserved that the find is scientifically insignificant. No

other vertebrate remains were found in the project area; however, the trace fossils of plants, invertebrates, and (probably) mammals are locally abundant.

3.2.1.3 Soils

Twenty-nine soil types occur within the project area (Appendix A). The predominant soil type on Peetz Table is the Platner-Rago-Dacono loam. Of the more common soils in the project area, most are deep and well-drained with slow to moderate permeability. Potential for water and wind erosion is slight to moderate. Badlands that occur adjacent to Spring Canyon are relatively steep and actively eroding and would be avoided during project construction. The Dix-Eckley complex, Altvan-Eckley sandy loams, Dix-Altvan complex, and the Ustic torriorthents have high potential for erosion (Figure 3.6), and additional measures above and beyond best management practices may be needed to control erosion if these soils are to be disturbed. None of the soils in the project area are classified as prime farmland (Amen et al. 1977).

3.2.2 Environmental Impacts and Mitigation Measures

3.2.2.1 Significance Criteria

Impacts associated with geological features would be considered significant if undercutting or subsidence caused the collapse of a turbine. Impacts to mineral resources would be considered significant if economic extraction of mineral resources is precluded. Impacts to paleontologic resources would be considered significant if important paleontological resources are disturbed without appropriate scientific data recovery. Impacts to soils would be considered significant if:

- highly erosive soils on moderate to steep slopes (15-20% slopes) are disturbed and cannot be stabilized to predisturbance conditions within 5 years; or
- vegetative productivity is eliminated due to compaction caused by construction activities.

3.2.2.2 Impacts of the Proposed Project

Geology. The proposed project would not impact the area's physiography. Minor impacts to topography would include temporary or permanent changes in the land surface and slope due to cut-and-fill activities required to excavate foundations and build roads. Any cut-and-fill areas that are not needed for operations would be regraded to the approximate original contour and reclaimed in accordance with landowner wishes. No channel crossings are anticipated, although construction would occur near ephemeral channels. During construction and operation, temporary drainage structures such as ditches, culverts, waterbars, and/or check-dams would be used, as needed, to divert runoff around wind project facilities, but overall drainage patterns would be preserved. As such, impacts to stream channel morphology would be minor for the 40-year life-of-project.

Geologic Hazards. No geologic features that could cause turbine collapse are known to occur in the project area.

Mineral Resources. Because no active mineral extraction operations occur or are likely to occur in the project area, the project would not impact mineral resources.

Paleontology. Direct impacts to fossils could include the inadvertent destruction of scientifically important fossils during excavation. The loss of scientifically important fossils would be an adverse effect. Overall, however, because the project footprint is quite small (about 222 acres) and no significant fossils were discovered during the field reconnaissance, the potential for loss of important fossils is low. Indirect impacts to paleontologic resources could occur from the loss of important fossil materials due to private collection or vandalism of newly exposed areas. Employee education about the value of these resources would minimize any indirect effects. Beneficial impacts could result from the discovery and analysis of fossils during project implementation.

Soils. Approximately 222 acres of soils would be impacted during initial construction and approximately 69 acres would remain under roads, turbines, and facilities for the 40-year

life-of-project. Some of the soils are currently cultivated, and are disturbed annually as they are tilled and used for agricultural production. Impacts to soils due to the project would be either minor and temporary or minor and long-term (in project footprint). Impacts would include soil loss through erosion, compaction, and loss of structure in soils that are disturbed or driven on during construction. Less than 20 turbines would be located on soils with high erosion hazard, and all of these would be located on slopes less than 10%. All surface-disturbed or compacted areas not needed for operation would be regraded, loosened, and revegetated in accordance with landowner wishes or easement agreements. Long-term impacts would occur where facilities are installed (e.g., along new roads and at tower sites). Since the overall footprint of the project is small relative to the size of the project area, impacts to soils would be minor.

Impacts of the proposed project on geology, paleontology, and soils would not be significant.

3.2.2.3 Impacts of the No Action Alternative

No impacts to geology or mineral resources would occur under the No Action Alternative. No impacts to the project from geologic hazards would occur. Impacts to paleontology and soils would continue at pre-existing levels due to agricultural activities.

3.2.2.4 Mitigation Measures

No additional mitigation, above and beyond the practices listed in Sections 2.2.10 and 2.2.11, are proposed.

3.3 WATER RESOURCES

3.3.1 Environmental Setting for the Proposed Project

Surface water drains the project area, flowing off of Peetz Table to the north, south, east, and west (Figure 3.7). All of the drainages are ephemeral, flowing only during snowmelt or in response to precipitation. The principal drainage in the project area is Spring Canyon, which

drains the eastern three-quarters of the project area. The canyon is highly dissected in Sections 31 and 32, T11N, R50W. Other surface water drainages are generally unnamed and are typically poorly defined swales or have been tilled and no longer exist. Small stock ponds or dugouts/reservoirs developed for livestock watering occur in some of the drainages outside of the project footprint area. Numerous playas (depressions without external drainage) also occur throughout the project area but most of these have been tilled.

Ground water in the project area is contained in the High Plains aquifer, which underlies 174,000 square miles in Colorado, Nebraska, Wyoming, Kansas, Oklahoma, Texas, and New Mexico (Topper et al. 2003). The High Plains aquifer consists of, in ascending order, the Tertiary Brule Formation of the White River Group, the Arikaree Formation, the Ogallala Formation; and Quaternary unconsolidated alluvial deposits, loess, and valley-fill deposits (Topper et al. 2003). Yields range from a low of less than 100 gallons per minute (gpm) in the Brule Formation to 3,100 gpm in the Ogallala aquifer and overlying alluvial deposits. The Ogallala aquifer is an important regional ground water resource, and it and the overlying alluvial deposits are typically unconfined. Recharge occurs primarily through infiltration of precipitation, with some streambed and irrigation water infiltration. Discharge typically exceeds recharge, as ground water is withdrawn for agricultural purposes. In February of 2001, 15,600 completed wells were documented in the High Plains aquifer, and 37 water wells occur in the project area (see Figure 3.7). Wells in the project area range from 250 to 300 ft deep (personal communication, December 2004, with Byron Gillham, CDOW). Between 1980 and 1997, water levels in the project area fluctuated by $\pm$5 ft (Topper et al. 2003). Ground water was not encountered in four 35-ft deep geotechnical exploration holes drilled in March 2005 near the substation location.

3.3.2 Environmental Impacts and Mitigation Measures

3.3.2.1 Significance Criteria

Impacts to water resources would be considered significant if:

- the quantity and quality of discharges from streams are modified by instream construction or accidental contamination (e.g., oil and gasoline spills) to the extent that water use by established users (e.g., private water supplies and irrigation) is measurably reduced;
- surface drainage patterns or stream channel morphology is altered;
- drilling foundations would create hydrologic conduits between aquifers used for water supply;
- water consumption would exceed existing permitted levels or quantities of water required for concrete and dust suppression exceeded available supplies;
- project activities violated the *Clean Water Act*; or
- pesticide use contaminated surface waters.

3.3.2.2 Impacts of Proposed Project

Impacts to surface water are expected to be minimal during construction and operation. Potential impacts to surface water quality include increased turbidity, salinity, and sedimentation of surface waters due to runoff and erosion from disturbed areas. Accidental spills of petroleum products or other pollutants also could impact surface water quality.

All surface-disturbed areas not needed for operations would be restored to the approximate original contour, and pre-existing drainage patterns would be preserved so the quantity and quality of discharges from streams would not be modified. In areas occupied by permanent facilities, surface runoff would be routed around the facility so that drainage patterns would be preserved. Permanent facilities would not be located in stream channels. If stream channels are crossed by access roads, appropriately-sized culverts would be installed to maintain channel

flows and protect channel morphology. Surface drainage patterns and stream channel morphology would not be altered.

Depth to bedrock in the project area ranges from 0 to more than 5 ft (Amen et al. 1977), so foundation excavation is likely to encounter bedrock. However, since water well depths in the project area range from 250 to 300 ft, foundation excavation is unlikely to encounter groundwater, and local ground water supplies are not anticipated to be affected.

Water for concrete for foundations and for dust control would come from off-site existing municipal or private sources (see Section 2.2.7), which may derive from surface water, ground water, or a combination of the two. None of these sources would be required to increase water production to meet project needs (personal communication, March 2005, with Mike Logsdon, President, Diamondback Services, Inc.). The project would result in the consumption of an average of 0.2 acre-ft per year of surface and/or ground water but is not expected to infringe on existing water rights or to cause undue depletion of these sources. Impacts to water resources due to the proposed project would not be significant.

Pesticide/herbicide use is not anticipated, so no impacts to surface waters from pesticide use would occur.

The project would be in compliance with the *Clean Water Act*.

3.3.2.3 Impacts of the No Action Alternative

Under the No Action Alternative, no impacts to surface or ground water would occur due to the project.

3.3.2.4 Mitigation Measures

In addition to Western's standard practices, a SWPPP would be developed as required by the EPA and would be implemented during construction to provide measures to minimize and prevent impacts to water resources. Erosion control measures including diversions, riprap, matting, sediment traps, and timely revegetation of all surface-disturbed areas would minimize runoff-related sedimentation impacts. Culverts would be equipped with erosion-control structures such as catch basins, ditches, or rock aprons, and these structures would be cleaned and maintained for the life-of-project. Erosion-prone areas (e.g., dissected land, badlands, and slopes ≥15-20%) would be avoided, where feasible. To reduce the potential for contamination of water due to inadvertent spills, SCE would prepare and implement a SPCCP as required by EPA. If needed, pesticide/herbicide use would be limited to non-persistent, immobile pesticides/herbicide and applied in accordance with manufacture directions.

3.4 FLOODPLAINS AND WETLANDS

3.4.1 Environmental Setting for the Proposed Project

One-hundred year floodplains occur along Spring Canyon, Cottonwood Creek (north of Spring Creek), and Cow Creek (northeast of Peetz) (see Figure 3.7) (Federal Emergency Management Agency [FEMA] 2004). The Cow Creek floodplain is currently under pivot irrigation and there is no surface expression of Cottonwood Creek in the project area (personal communication, December 2004, with Brent Orr, attorney for SCE), so the floodplains on these two creeks no longer exist.

No wetlands occur in the 2,000-ft or 50-ft wide project footprint areas. According to National Wetland Inventory (NWI) maps for the Peetz and Haystack Butte 7.5' Quadrangles, wetlands may occur within the overall project area (see Figure 3.7). Most are apparently playas and are classified on NWI maps as palustrine (non-riverine)-farmed. On-site field reconnaissance indicated that most, if not all, of these playas have been farmed. Other potential palustrine

wetlands are scattered across Peetz Table. Spring Canyon is classified as a riverine wetland, but no wetland vegetation is known to occur in Spring Canyon in the vicinity of the project area.

3.4.2 Environmental Impacts and Mitigation Measures

3.4.2.1 Significance Criteria

Impacts to floodplains and wetlands would be considered significant:

- if facilities were constructed in a floodplain and caused an increase in the potential for flooding or violated any floodplain protection standards;
- if a flood event would cause damage to wind project facilities; or
- if construction resulted in long-term loss of wetlands or wetland vegetation.

3.4.2.2 Impacts of the Proposed Project

Since no floodplains or wetlands occur within the project footprint (i.e., the 2,000-ft and 50-ft wide survey corridors shown on Figure 2.1), these resources would not be impacted by the project. SCE would use best management practices to prevent sedimentation in downstream floodplains.

3.4.2.3 Impacts of the No Action Alternative

No impacts to floodplains or wetlands would occur under the No Action Alternative.

3.4.2.4 Mitigation Measures

No additional mitigation is proposed.

3.5 VEGETATION

3.5.1 Environmental Setting for the Proposed Project

Project area vegetation is a mosaic of farmland (12,660 acres or 57% of the project area), Conservation Reserve Program (CRP) land (2,300 acres [10%]), native prairie (7,094 acres [32%]), and shelterbelts (scattered throughout the project area) (Figure 3.8). Principal crops are winter wheat and millet. Some areas are interseeded and used for hay and/or pasture for livestock. CRP land typically contains a mixture of tall and short grasses and may be grazed by livestock or returned to crop production when the CRP contract expires, unless the CRP is extended and these areas are re-enrolled. Native vegetation is typical of shortgrass prairie, with species such as blue grama, buffalograss, western wheatgrass, little bluestem, switchgrass, prairie sandreed, sand dropseed, and sedges common (Appendix A). Shrubs typically include big sagebrush, rabbitbrush, Rocky Mountain juniper, eastern red cedar, yellow current chokecherry, squawbush, wild current, and wild plum. Many farmsteads and abandoned farm sites have an adjacent shelterbelt of trees and shrubs. Most of the shelterbelts on abandoned farmsteads contain decadent/senescent trees.

3.5.2 Environmental Impacts and Mitigation Measures

3.5.2.1 Significance Criteria

Impacts to vegetation would be considered significant:

- if construction results in the long-term loss of riparian vegetation or
- if construction or operation results in the invasion of non-native weedy species.

3.5.2.2 Impacts of the Proposed Project

Direct impacts to vegetation would include surface disturbance of 222 acres during construction (see Table 2.1)--84 acres of native prairie, 102 acres of cropland, and 36 acres of CRP land.

Most of the disturbed area would be reclaimed and revegetated, with 69 acres remaining occupied by roads, turbine foundations, and facilities for the life-of-project (26 acres of native prairie, 32 acres of cropland, and 11 acres of CRP land). Since the project footprint would be relatively small compared with the overall size of the project area and much of the area is tilled annually for agricultural production, these direct impacts would be minimal. The project would not impact any riparian vegetation because no riparian vegetation occurs within the project footprint. Weed infestations could constitute an adverse effect, but SCE would take measures (e.g., washing construction vehicles before going on-site, avoiding weedy areas once on-site, and controlling weeds in accordance with landowner wishes or easement agreements) so that impacts from weeds are anticipated to be minimal. No tree removal is anticipated--if tree removal becomes necessary, it would be limited to those trees that impede safe and efficient project operation. Any surface-disturbed areas that are not required for operations would be revegetated pursuant to easement agreements with landowners as soon as possible after construction. Impacts to vegetation due to the proposed project would not be significant.

3.5.2.3 Impacts of the No Action Alternative

No impacts to vegetation would occur under the No Action Alternative.

3.5.2.4 Mitigation Measures

In addition to Western's standard practices, surface-disturbed areas not needed for the operation of the project would be reclaimed as soon as practical. SCE would limit the spread of weeds by washing equipment before bringing it on-site, and if weeds spread due to the project, SCE would implement a weed control program in conjunction with the landowners and lease agreements.

3.6 WILDLIFE

3.6.1 Environmental Setting of the Proposed Project

The project area provides habitat for a variety of wildlife species typical of agricultural lands and native shortgrass prairie in northeastern Colorado. Pronghorn antelope and mule deer from Game Management Unit (GMU) 90 and a small portion of GMU 89 are big game species that occur in the area. GMU 90 covers most of the northeastern quarter of Logan County and a small portion of northwestern Sedgewick County. The project area contains overall range for pronghorn, and the very southern portions of the project area are within a pronghorn concentration area. An estimated 200-250 pronghorn presently occupy GMU 90 (personal communication, October 2004, with Marty Stratman, CDOW). The entire project area is mule deer overall range, and about 200 mule deer occupy GMU 90. No crucial winter ranges for pronghorn or mule deer occur in the project area. White-tailed deer overall range occurs south of the project area, so white-tailed deer are not likely to occur on-site.

Predator species that are likely to occur in the project area include coyote, red fox, swift fox, raccoon, long-tailed weasel, mink, American badger, eastern spotted skunk, striped skunk, and, possibly, bobcat and mountain lion (CDOW unpublished data) (Appendix B).

A number of small mammals may occur in the project area. Lagomorph species likely to occur in the project area include desert cottontail, eastern cottontail, black-tailed jackrabbit, and white-tailed jackrabbit (CDOW unpublished data) (Appendix B). Spotted ground squirrel, thirteen-lined ground squirrel, black-tailed prairie dog, fox squirrel, northern pocket gopher, plains pocket gopher, plains pocket mouse, silky pocket mouse, hispid pocket mouse, Ord's kangaroo rat, western harvest mouse, plains harvest mouse, deer mouse, northern grasshopper mouse, bushy-tailed woodrat, prairie vole, meadow vole, Norway rat, and porcupine are rodent species that could occur in the project area. Black-tailed prairie dogs were observed in the project area during project-related fieldwork. Other mammals that could occur in the project area include Virginia opossum, least shrew, eastern mole, and six bat species.

No bat roosts are known to occur in the area; however, historically bats roosted in a tree about 2 mi north of the project area (personal communication, October 2004, with Byron Gillham, CDOW). Roosting habitat includes the trees, elevators, and other structures (e.g., barns) in the project area. Big brown bat, little brown myotis, hoary bat, red bat, silver-haired bat, and western small-footed myotis are bat species that are known to occur or likely to occur in Logan County (CDOW unpublished data) (see Appendix B).

A variety of reptiles and amphibians (herptiles) may occur in the project area, including leopard frog, tiger salamander, wandering garter snake, and gopher snake (CDOW unpublished data) (see Appendix B).

An estimated 266 species of birds occur in Logan County and may occur in the project area (CDOW unpublished data) (see Appendix B)--most species probably occur in the project area only during migration and thus would be occasional visitors only. Many of the species (i.e., waterfowl, shorebirds, waders) listed in Appendix B would not breed in the project area because no breeding habitat exists, but they may occasionally visit the project area if they are breeding and nesting in nearby habitat or feeding in agricultural fields during migration. The project area contains breeding and nesting habitat for several species of raptors, including Swainson's hawk, red-tailed hawk, ferruginous hawk, golden eagle, northern harrier, prairie falcon, American kestrel, Cooper’s hawk, sharp-shinned hawk, great-horned owl, barn owl, short-eared owl, eastern screech owl, and burrowing owl. An initial field survey for raptor nests was completed in October 2004; 24 raptor nests are known to occur in the project area's shelterbelts and on the small rimrock outcrops in Spring Canyon (see Figure 2.1). Raptor species observed during project-related fieldwork to date include golden eagle, prairie falcon, American kestrel, merlin, sharp-shinned hawk, northern harrier, red-tailed hawk, ferruginous hawk, rough-legged hawk, short-eared owl, great-horned owl, and barn owl. A raptor nest inventory would be conducted during the 2005 breeding season to identify active nests so that appropriate buffer zones can be placed until the young have fledged.

Snipe, thrashers, thrushes, shrikes, pheasant, grouse, vireos, warblers, wrens, grosbeaks, buntings, towhees, sparrows, and blackbirds also likely breed and nest in the project area. Pheasants were observed in the project area during project-related fieldwork. Sharp-tailed grouse may occur on-site, but there are no known leks in the area (personal communication, October 2004, with Larry Crooks, CDOW). Lesser prairie chicken are not known to occur in the area. Mourning doves are common.

There are no fisheries in the area due to lack of suitable streams or lakes/reservoirs to support fish populations.

3.6.2 Environmental Impacts and Mitigation Measures

3.6.2.1 Significance Criteria

Impacts to wildlife resources would be considered significant:

- if construction activities occur on established leks or breeding grounds of upland game birds during the nesting season;
- if critical big game winter range is affected by construction during critical winter periods, causing disturbance or displacement of wintering animals;
- if an active raptor nest is disturbed; or
- if mortality of birds and/or bats from collisions with wind turbines reduced local populations of the affected species to the point where they would be considered for listing as endangered or threatened.

3.6.2.2 Impacts of the Proposed Project

Impacts to big game are expected to be minimal because the land is primarily agricultural and is subject to regular human activity from farming and ranching activities. Impacts to big game could include direct mortality due to collisions with vehicles, loss of foraging habitat, and displacement from portions of the project area during construction due to human presence or

noise. Mortalities due to collisions should be minimal. Since the overall footprint of the project would be small relative to the size of the project area, loss of forage would be negligible. Forage distribution has already been substantially altered by agricultural activities, where crops provide abundant forage and fallow areas do not, and the footprint of the wind project likely would be unnoticeable within this larger agricultural management system. Any big game using the area likely would habituate to the turbines and operation activities. No detectable changes in pronghorn antelope abundance occurred at the Arlington, Wyoming, wind project after construction (Johnson et al. 2000), so pronghorn may habituate to wind development. Mule deer also are fairly tolerant of human activities (Reed 1981; Irby et al. 1988), and there is already frequent human presence due to farming and ranching activities, so it is likely that any displacement would likely be temporary and displacement effects would be minimal. No crucial winter range or known birthing areas occur on-site, so big game critical habitats would not be affected.

Bats may be impacted due to collision-related mortality. Other wind projects are known to cause substantial bat mortality (FWS 2003), the causes of which are being investigated (Energetics, Inc. 2004). Since bats are not known to roost in the area and none of the six species that may occur in the area are Federal- or state-listed TEP&C species, impacts to bats are expected to not be significant. Bats may migrate through the project area and thus may be at risk, but the species known to occur in Logan County are common. Impacts to other mammals and herptiles are also expected to be minimal. Mammals are relatively mobile, herptiles are a little less so, and, while mortality due to collisions with vehicles or during excavation is possible, these occurrences are anticipated to be infrequent. As with big game, the overall agricultural management system within the project area already strongly influences forage/prey availability, so the short-term 222 acres of loss of habitat (69 acres over the life-of-project) from the project footprint would probably have a minimal effect on other mammals and reptiles.

Birds may be directly impacted due to collisions with turbines, meteorological towers, overhead power lines, and substation structures; and through habitat loss due to vegetation disturbance, human presence, and noise. The potential impacts of wind power development on birds is

well-documented, but wind power-related mortality is low compared with other sources of bird mortality (Table 3.2) (National Wind Coordinating Committee [NWCC] 2001).

There are no data regarding avian mortality at the existing wind project west of Peetz (personal communication, January 2005, with Stephanie Jones, FWS). The FWS has developed a set of recommendations to avoid and minimize impacts to wildlife from wind turbines (FWS 2003). These recommendations and a discussion of project adherence to these recommendations are presented in Table 3.3.

Impacts to wildlife due to the proposed project would not be significant.

3.6.2.3 Impacts of the No Action Alternative

No impacts to wildlife would occur under the No Action Alternative.

3.6.2.4 Mitigation Measures

To minimize impacts to wildlife, SCE would implement the following mitigation measures practices:

- conduct a raptor nest search during the 2005 nesting season, and time construction to avoid activities within an appropriate buffer zone of any active nests (see Section 2.2.11.9) during the stipulated period or until after the young have fledged;

Table 3.2 Estimated Annual Avian Collision Mortality in the U.S.[1]

Source of Mortality	Estimated No. of Mortalities (millions)
Vehicles	60 - 80
Buildings and windows	98 - 980
Power lines	0.01 - 174
Communication towers	4 - 50
Wind generation facilities	0.01 - 0.04

[1] Source: NWCC (2001).

Table 3.3 Site Development and Turbine Design and Operation Recommendations.

FWS Interim Guidance	Existing Conditions and Proposed Action
Site Development	
1. Avoid placing turbines in documented locations of any species of wildlife, fish, or plant protected under the Federal *Endangered Species Act* (ESA).	No documented locations of any species of wildlife, fish, or plants protected under the ESA occur in the project area. While both federal- and state-listed TEP&C species may occur in the project area, impacts are expected to be minimal.
2. Avoid locating turbines in known local bird migration pathways or in areas where birds are highly concentrated, unless mortality risk is low (e.g., birds present rarely enter the rotor-swept area). Examples of high concentration areas for birds are wetlands, State or Federal refuges, private duck clubs, staging areas, rookeries, leks, roosts, riparian areas along streams, and landfills. Avoid 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.	There are no known local bird migration pathways in the project area. There are no known high concentration areas such as wetlands, etc. in the project area. Daily movements may occur among the project area's shelterbelts, agricultural fields, and prairie habitats, but these are common features of the landscape, and thus the project is not located in an area where daily movements would pose more risk than other sites. SEC has avoided placing turbines between Spring Canyon and an active prairie dog colony. The project area does not have a high incidence of fog, mist, or other conditions of low visibility.
3. Avoid placing turbines near known bat hibernation, breeding, and maternity/nursery colonies, in migration corridors, or in flight paths between colonies and feeding areas.	There are no known bat colonies in the project area. It is not known if migration corridors or flight paths occur in the project area.
4. Configure turbine locations to avoid areas or features of the landscapes 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.	Turbines have been located on relatively flat lands, away from dips, saddles, and shelterbelts (i.e., potential raptor nesting sites). No turbines or other project facilities would be placed in prairie dog colonies.
5. Configure turbine arrays to avoid potential avian mortality where feasible. For example, group turbines rather than spreading them widely, and orient rows of turbines parallel to known bird movements, thereby decreasing the potential for bird strikes. Implement appropriate storm water management practices that do not create attractions for birds, and maintain contiguous habitat for area-sensitive species (e.g., greater sage-grouse).	SEC has configured the project to group turbines as closely as possible without losing energy generating capacity due to wake effects among turbines. Widely spacing turbines increases overall project costs due to the need for more power lines and more roads, so, from a cost perspective, the project is designed with the closest spacing possible. SEC will implement a storm water pollution prevention plan. The project will result in habitat fragmentation for shortgrass prairie species; however, the area is already highly fragmented by existing agricultural activities.
6. Avoid fragmenting large, contiguous tracts of wildlife habitat. Where practical, place turbines on lands already altered or cultivated and away from areas of intact and healthy native habitats. If not practical, select fragmented or degraded habitats over relatively intact areas.	About 46% of the project's facilities will be placed on land that is currently tilled; 38% will be located in native shortgrass prairie. The shortgrass prairie is highly fragmented by existing roads, residences, transmission lines, etc.
7. Avoid placing turbines in habitat known to be occupied by prairie grouse or other species that exhibit extreme avoidance of vertical features and/or structural habitat fragmentation. In known prairie grouse habitat, avoid placing turbines within 5 miles of known leks (communal pair formation grounds).	According to CDOW, no prairie grouse are known to occur in the project area (personal communication, October 2004, with Larry Crooks, CDOW).
8. Minimize roads, fences, and other infrastructure. All infrastructure should be capable of withstanding periodic burning of vegetation, as natural fires or controlled burns are necessary for maintaining most prairie habitats.	The only facility that will be fenced is the project substation and O&M building, where fencing is required for public health and safety reasons and the protect SCE's property. SEC is using existing roads for much of its access; it will construct about 26.0 mi of new roads. The number of roads, fences, and other infrastructures are minimized to minimize project development and operation costs.

Table 3.3 (Continued)

FWS Interim Guidance	Existing Conditions and Proposed Action
9. 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. For example, avoid attracting high densities of prey animals (rodents, rabbits, etc.) used by raptors.	All disturbed areas in native prairie will be reclaimed with native, adapted species. SEC will control weeds.
Turbine Design and Operation	
1. Use tubular supports with pointed tops rather than lattice supports to minimize bird perching and nesting opportunities. 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. All existing guy wires should be marked with recommended bird deterrent devices (APLIC 1994).	SEC will use tubular towers and perch-free nacelles.
2. If taller turbines (top of the rotor-swept area is >199 feet above ground level) require lights for aviation safety, the minimum amount of pilot warning and obstruction avoidance lighting specified by FAA should be used (FAA 2000). Unless otherwise requested by the FAA, only white strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. Solid red or pulsating red incandescent lights should not be used, as they appear to attract night-migrating birds at a much higher rate than white strobe lights.	This recommendation has been revised since its initial publication. SEC is preparing a plan to meet FAA requirements while minimizing the number of lights for the project.
3. Where the height of the rotor-swept area produces a high risk for wildlife, adjust tower height where feasible to reduce the risk of strikes.	The height of the rotor-swept area for the Spring Canyon wind project is not known to pose a high risk to wildlife.
4. Where feasible, place electric power lines underground or on the surface as insulated, shielded wire to avoid electrocution of birds. Use recommendations of the APLIC (1994, 1996) for any required above-ground lines, transformers, or conductors.	All in-field collection and communications lines will be installed underground. Only about 1.0 mi of overhead power collection lines will be constructed, and these will be constructed in accordance with APLIC recommendations.
5. High seasonal concentrations of birds may cause problems in some areas. If, however, power generation is critical in these areas, an average of 3 years monitoring data (e.g., acoustic, radar, infrared, or observational) should be collected and used to determine peak use dates for specific sites. Where feasible, turbines should be shut down during periods when birds are highly concentrated at those sites.	No seasonal high concentrations of birds are known to occur in the project area.
6. When upgrading or retrofitting turbines, follow the above guidelines as closely as possible. If studies indicate high mortality at specific older turbines, retrofitting or relocating is highly recommended.	Not applicable.

- avoid placing turbines or other facilities in active prairie dog colonies;
- design the project to comply with FWS guidelines to the extent practical;
- use state-of-the-art turbines and wind industry standard practices;
- minimize noise;
- prohibit hunting, dogs, and possession of firearms by employees;
- set and enforce speed limits;
- limit traffic to designated roads;
- minimize disturbance;
- promptly reclaim disturbed areas, including restoration of shortgrass prairie;
- minimize erosion and promptly clean up spills.

3.7 SPECIAL STATUS AND SENSITIVE SPECIES

3.7.1 Environmental Setting for the Proposed Project

A list of endangered, threatened, proposed, and candidate species was obtained from FWS on November 22, 2004 (Table 3.4 and Appendix C). A list of state-listed TEP&C species was obtained from the CDOW website (Appendix D) and the Colorado Natural Heritage Program (CNHP) (Table 3.5). Additional information concerning sensitive species in the project area was obtained from the CNHP (Appendix E). The biological assessment is in Appendix F.

Fieldwork was conducted from February 2-9, 2005, after the turbine locations and proposed access road locations had been staked by SEC, and included surveys for habitat and any species within 1,000 ft on either side of each turbine string and proposed new access roads (Figure 2.1). Therefore, a 2,000-ft wide corridor around all areas to be disturbed was surveyed. In addition, the proposed substation and operation and maintenance building location, including a 200-ft buffer around the substation and operation and maintenance building, was surveyed. The 50-ft wide collection system corridors and crane paths were surveyed on March 31 and April 1. Of the entire 22,054-acre project area, 6,424 acres surveyed.

Table 3.4 Federally Listed Species That May Occur in Logan County, Colorado.[1]

Species	Habitat	Potential to Occur in Project Area or to be affected by the Project
Interior least tern[2]	Nest in riverine areas with sparsely vegetated sand and gravel bars within wide, unobstructed river channels or salt flat along lake shorelines	No suitable nesting habitat in project area; known to occur in Logan County; possible flyovers during migration
Piping plover[2]	Wide, sparsely vegetated sand or gravel beaches adjacent to vast alkali lakes; washed-out hillside beaches on smaller, semi-permanent alkali wetlands; beaches, sand flats, and floodplains; forage near water	No suitable nesting habitat in project area; known to occur in Logan County; possible flyovers during migration
Bald eagle	Breeding habitat includes rivers, lakes, and reservoirs with forested shorelines of cliffs; winter roosting areas include large trees in sheltered areas near open water	No suitable breeding or winter roost areas occur in the project area; suitable foraging habitat present; flyovers likely
Whooping crane[2]	Breeding and nesting occurs in Wood Buffalo National Park, Alberta and Northwest Territories, Canada; they winter in Aransas National Park, Texas; whooping cranes use a variety of habitats during migration including cropland, wetlands, and riverine habitat	No nesting habitat occurs in the project area; known to occur in Logan County; possible flyovers and stopovers in cropland during migration
Pallid sturgeon[2]	Bottoms of large, turbid, relatively warm free-flowing rivers	Pallid sturgeon occur in the South Platte River, downstream from the project area

[1] Source: Letter from Susan Linner, U.S. Fish and Wildlife Service, to Karyn Coppinger, TRC Mariah Associates Inc., November 22, 2004 (see Appendix C). See appendices for detailed species accounts.

[2] Water depletions in the South Platte River may affect the species and/or critical habitat in downstream reaches in other states.

Table 3.5 State-listed TEP&C Species Likely to Occur in the Project Area.[1]

Species	Habitat	Potential to Occur in the Project Area
Birds		
Burrowing owl	Plains and basins, often associated with prairie dog colonies	Potential breeding, nesting, and foraging habitat in black-tailed prairie dog colonies
Ferruginous hawk	Open grasslands and shrublands	Potential breeding, nesting and foraging habitat; observed on-site
Long-billed curlew	Meadows, pastures, shoreline, and marshes	Potential resident
Mountain plover	Sparse shortgrass or mixed grass prairie; also in short sagebrush plains; often associated with prairie dog colonies	Potential breeding, nesting, and foraging habitat
Peregrine falcon	Mountainous zones or cliffs near large lakes and rivers	Potential to fly over site during migration; no nesting habitat
Sandhill crane	Mud flats around reservoirs, moist meadows, and agricultural areas, parks with grassy hummocks and watercourses, beaver ponds, and natural ponds lined with willow or aspen, wetlands and shallow marshes	Potential to fly over site during migration; no potential breeding, nesting, and minimal foraging/resting habitat
Mammals		
Black-tailed prairie dog	Shortgrass prairie, usually with loose, sandy soils; can form large, dense colonies	Occurs on-site
Northern pocket gopher	Meadows and along streams	Potential resident
Swift fox	Shortgrass prairie, but can be found in sagebrush-grasslands; they are found particularly in sparsely vegetated areas such as prairie dog colonies	Potential rare visitor

[1] Only those species that are likely to occur in the project area, based on habitat presence--or in the case of black-tailed prairie dogs, ferruginous hawks, burrowing owls, and long-billed curlew that have been observed on-site--are included in this table.

In addition to TEP&C species habitat mapping, a preliminary raptor nest inventory was conducted on October 27, 2004, and on March 28 and 29, 2005, to determine if bald eagle nesting habitat or nests occurred in the project area. All potential raptor nesting habitat was searched for nests using the naked eye, binoculars, or a spotting scope. All nest locations (regardless of species) were mapped on a 7.5' topographic map, photographs were taken, and a raptor nest inventory data sheet was completed.

On January 29, 2005, Karyn Coppinger (TRC Mariah) was on-site conducting other business and observed a bald eagle perched on the ground in a cropped field.

Habitats for TEP&C species were identified based on current habitat descriptions provided by the FWS. Lists of wildlife species known to occur or that may occur in Logan County were obtained from the CDOW (CDOW n.d.). All suitable TEP&C habitats were mapped using a global positioning system (GPS) either from an all-terrain vehicle or on foot. The GPS data were downloaded into an ArcView geographic information system (GIS) database for the project area, and maps were created.

No Federal TEP&C plant species are expected to occur in Logan County, and the State of Colorado has no listed plant species or communities (CNHP 2004). TEP&C plant species are not discussed further in this EA.

3.7.1.1 Bald Eagle

No bald eagle nesting habitat occurs in the project area. Bald eagles are known to be winter visitors in the region, and the dead trees in shelterbelts scattered throughout the area may provide perching habitat. Although the area is over 20 mi from perennial water with preferred bald eagle feeding areas including fisheries and waterfowl concentration areas (e.g., the South Platte River, Sterling Reservoir, and Jumbo Reservoir), bald eagles can easily cover this distance while foraging and thus may forage on the project area at any time of year. A bald eagle was observed in the project area perched on the ground in a farmed field in January 2005. The CDOW does not have raptor nest records for this area (personal communication, October 2004, with Byron

Gillham, CDOW), so it is not known if bald eagles nest in the general vicinity, but the lack of preferred nesting habitat suggests that bald eagle nesting is unlikely. None of the nests observed in the project area during fall 2004 or spring of 2005 appear to be bald eagle nests.

3.7.1.2 Other Federally Listed Species

No habitat for pallid sturgeon, whooping crane, interior least tern, or piping plover occurs in the project area, but these species are of concern in Logan County because water depletions in the South Platte River may affect the species and/or critical habitat downstream. Pallid sturgeon does not occur in the project area. Whooping crane, interior least tern, and piping plover are known to occur in Logan County (CDOW unpublished data) (Appendix B), where the Platte River is a primary migratory corridor. There is one recorded whooping crane observation (1979) for Cheyenne County, Nebraska (personal communication, January 2005, Rick Schneider, Nebraska Game and Parks Commission). However, during migration between breeding and wintering areas, whooping crane, interior least tern, and piping plover may migrate through the project area; and thus would be infrequent visitors, mostly in spring and fall.

3.7.1.3 State-listed Species

The project area's shortgrass prairie, CRP lands, and/or agricultural fields (Figure 3.9) provide suitable habitat for burrowing owl, ferruginous hawk, long-billed curlew, mountain plover, peregrine falcon, sandhill crane, black-tailed prairie dog, northern pocket gopher, and swift fox. Within the survey area, 2,445 acres are shortgrass prairie, 2,967 acres are cultivated fields, and 1,012 acres are CRP lands.

Two black-tailed prairie dog colonies (42 acres) occur within the 2,000-ft and 50-ft survey corridors and other prairie dog colonies occur within the project area but outside of the survey corridor. Prairie dog colony locations are highly variable because of prairie dog control practices

used by landowners; some colonies observed in the fall of 2004 are currently inactive. The 42 acres of colonies provide nesting habitat for burrowing owls, which may be summer residents or may migrate through the area during spring and fall. Burrowing owls were observed in the project area during fieldwork.

Ferruginous hawk are known to occur in the project area. There are 24 known raptor nests within the project area, and the ferruginous hawks likely nest in the general vicinity. Ferruginous hawks were observed on-site in March 2005, but it is not currently known if ferruginous hawks nest within the project area and a 1.0-mi buffer. Ferruginous hawks also forage in and migrate through the project area; therefore, ferruginous hawks occur in the project area during spring, summer, and fall.

Long-billed curlews may nest and forage in the project area's shortgrass prairie and may also migrate through the project area. They were observed on-site during fieldwork, and they may be present in the area during spring, summer, and fall.

Approximately 342 acres of suitable mountain plover habitat occur within the 2,000-ft and 50-ft survey corridors. Portions of the project area's shortgrass prairie and the black-tailed prairie dog colonies provide suitable nesting habitat. In addition, fallow agricultural fields or those planted later in the season (i.e., with low vegetation at the start of the breeding season) may be suitable mountain plover nesting habitat (although nests would be abandoned in cases where crops grow too tall after nesting is initiated); therefore, an additional 2,967 acres within the 2,000-ft and 50-ft survey corridors may be mountain plover habitat, depending on land management practices. Mountain plover may also migrate through the project area. Therefore, they may occur in the area during spring, summer, and fall. Mountain plover have been documented in Cheyenne County, Nebraska, immediately north of the project area (personal communication, January 2005, Rick Schneider, Nebraska Game and Parks Commission).

Peregrine falcons may forage in and migrate through the project area, but no nesting habitat occurs in or immediately adjacent to the area. Peregrine falcons are likely rare visitors to the area.

Sandhill cranes may migrate through the project area, but no breeding or nesting habitat occurs in the area. During migration, sandhill cranes may stopover to feed in the project area's agricultural fields. Sandhill cranes, therefore, may occur in the project area during spring and fall migration.

Two black-tailed prairie dog colonies occur (42 acres) within the 2,000-ft and 50-ft survey corridors. Other colonies occur in the project area but not within the survey corridors. Black-tailed prairie dogs are year-round residents in the project area.

Northern pocket gophers may occur in the project area's shortgrass prairie and CRP lands (see Figure 3.8) and may be year-round residents.

Swift fox may occur in any of the project area's habitats and may den in the project area's shortgrass prairie (see Figure 3.8), although no dens are known to occur in the 2,000-ft or 50-ft survey corridors. The CDOW has not been sampling in the project area proper, but no swift fox have been captured on CDOW transects in northeastern Colorado, so there does not appear to be a high concentration of swift fox in northern Logan County (personal communication, February 2005, with Kirstie Bay, CDOW). Swift fox are likely rare visitors to the project area.

3.7.2 Environmental Impacts and Mitigation Measures

3.7.2.1 Significance Criteria

Impacts to special status and sensitive species would be considered significant if effects from the Proposed Project such as loss of individuals or loss of critical habitat result in a "jeopardy" Biological Opinion under Section 7 of the ESA or similar loss of state listed species.

3.7.2.2 Bald Eagles

Impacts to bald eagles could include direct mortality due to collisions with turbines and overhead power lines. In the wind power literature (e.g., National Wind Coordinating Committee 2001),

collisions with wind turbines are rare events, and, if eagles only infrequently visit the area, potential for collision-related mortality is low. SCE would use state-of-the-art turbine technology, including large unguyed turbines with tubular towers, slow-moving rotors, and few perches, thus reducing the potential for bird collisions. The 1.0 mi of overhead power lines would be designed per the *Suggested Practices for Raptor Protection on Power Lines--the State of the Art in 1996* (Avian Power Line Interaction Committee 1996) to avoid potential electrocution impacts. Bald eagles feed on carrion, among other things, and thus are at risk of collision with vehicles when they feed on road-killed animals, but again, there is low potential for this impact. Eagles may be attracted to the area if construction increases the number of road kills; a recommended mitigation is to set and enforce speed traffic speed limits and to keep carrion off roads.

No indirect effects, such as displacement from preferred habitat or loss of prey base are anticipated because the project area does not contain preferred habitat and eagles are likely only rare visitors to the area.

The project may affect, but is not likely to adversely affect, bald eagles.

3.7.2.3 Other Federally Listed Species

Direct impacts to whooping crane, interior least tern, and piping plover due to collisions with turbines and the 1.0 mi of power lines would be similar to those described for bald eagle (e.g., potential for collision-related mortality is low).

Indirect impacts could occur if the project resulted in water depletions in the South Platte River. On average, the project would use an estimated 0.2 acre-ft per year (see Table 2.4).

In 2002, the FWS prepared a biological opinion in its *Revised Intra-Service Section 7 Consultation for Federal Agency Actions Resulting in Minor Water Depletions to the Platte River System* (FWS 2002). The biological opinion covers any Federal actions other than wetland restoration projects that result in average annual depletions of 25 acre-ft or less to the Platte

River system, regardless of location within the basin. The effects analysis and conservation measures apply only to Federally listed species, designated whooping crane habitat, and proposed critical habitat for the piping plover along the Platte River in Nebraska.

In accordance with the above-referenced biological opinion, "Federal agencies should continue to conclude that each action resulting in a depletion of 25 acre-feet or less per year to the Platte River system may adversely affect the whooping crane, interior least tern, piping plover, and/or pallid sturgeon, designated whooping crane critical habitat, and proposed piping plover critical habitat" (FWS 2002). No mitigation is required because the U.S. Forest Service and the FWS have provided funds to the Fish and Wildlife Foundation account for the purposes of offsetting the adverse effects of Federal agency actions resulting in minor water depletions, such as the Spring Canyon Wind Energy Project.

3.7.2.4 State-listed Species

SCE has designed the project to avoid the area's black-tailed prairie dog colonies, so burrowing owl nests would not be impacted. Nesting burrowing owls may be displaced from portions of this colony by construction noise and human activity in areas adjacent to the colony during construction. Prior to construction, the two prairie dog colonies within the survey corridors would be searched for burrowing owls and their sign, and if owls occur in the colony, construction may be delayed within 0.5 mi of the colony until after the nesting season (early August). During operation, impacts to burrowing owls could include mortality due to collisions with vehicles or wind turbines. Since burrowing owls are mobile, collisions with vehicles are unlikely, and since SCE will use state-of-the-art turbines with tubular towers and slow-turning rotors, mortalities during and after construction are anticipated to be rare events. Project impacts to burrowing owls are expected to be low.

Construction-related impacts to ferruginous hawks could include nest abandonment and the resultant loss of eggs or chicks if an active nest occurs on or near the project area. SCE would conduct a raptor nest survey prior to construction, and any active nests would be avoided by an appropriate buffer until the chicks have fledged or the nest fails. Ferruginous hawks may be

displaced from the project area due to construction noise and human activity but are expected to resume the use of project area habitat after construction is complete. Operational impacts would include the potential for mortality due to collisions with turbines, but with the use of modern turbines, mortalities are expected to be rare events. Impacts to ferruginous hawks are expected to be low. Post-construction monitoring would be conducted (see Section 2.2.11.9) in part to determine if ferruginous hawk mortality is occurring, and additional mitigation may be required if unacceptable levels of mortality occur, as determined by Western.

Impacts to long-billed curlew during construction could include nest abandonment due to noise and human activity, nest destruction by vehicles or during excavation, and mortality of individuals due to collisions with vehicles. Since much of the project area is tilled annually and only a small acreage of untilled ground would be disturbed, the potential to impact long-billed curlew nests is low. Since long-billed curlews are mobile, potential for collisions with vehicles is also low. Operational impacts could include mortality due to collisions with turbines and overhead lines, but, as described for ferruginous hawks above, mortalities are expected to be rare events. Impacts to long-billed curlew are expected to be low.

Impacts to mountain plover during construction could include direct mortality due to collisions with vehicles, inadvertent nest destruction, and displacement from habitat due to noise and human activity. SCE would conduct mountain plover surveys in all potential habitat prior to construction, and, if nests are found, SCE would avoid construction within 0.25 mi of a nest until the chicks are mobile (about 35 days after the nest is discovered or 7 days post-hatching) unless otherwise approved by Western. Impacts during operation could include direct mortality due to collisions with vehicles and overhead lines and inadvertent nest destruction, particularly if mountain plover elect to nest on turbine pads or along access roads and ROWs, which they tend to do. Employees would be instructed on how to identify mountain plover and to avoid driving in areas where plover are seen until the area has been inspected for nests by a qualified biologist. Operational impacts could also include mountain plover collisions with turbines. However, because mountain plover tend not to fly and typically fly close to the ground when they do fly (U.S. Bureau of Land Management 1995), and because only 1.0 mi of overhead power lines would be built, collision-related mortalities should be minimal. During courtship, mountain

plover fly to heights of about 15 to 30 ft, hold their wings in a deep "V" position, and float slowly to the ground; even during this display, mountain plovers would be well below the lowest reaches of the rotors (135 ft). Impacts to mountain plover are expected to be negligible.

Peregrine falcon may be rare visitors to the project area, so both construction and operation impacts are expected to be minimal.

Sandhill cranes may migrate through the project area and may stop to feed in agricultural fields in the project area. Impacts during construction would include displacement from potential resting and feeding areas, but this impact is expected to be minimal because there are abundant agricultural fields throughout the region that could provide these functions. Impacts during operation could include sandhill crane mortality due to collisions with turbines and overhead lines. Sandhill cranes typically migrate at heights well above 400 ft (Toepler and Crete 1978) and thus would only be affected if taking off or landing on or near the site during resting/feeding stopovers or if they are forced down during bad weather. With the use of modern turbines, the potential for mortality is expected to be low. SCE currently is conducting a spring migration study to evaluate sandhill crane use of the project area and may implement additional operational practices, if needed, to minimize potential for sandhill crane mortality.

SCE has designed the project to avoid any surface disturbance in black-tailed prairie dog colonies, so black-tailed prairie dogs would not be impacted by the project with the exception of the potential for vehicle-related mortality.

Construction impacts to northern pocket gopher could include mortality due to collisions with vehicles and inadvertent destruction of burrows during excavation. Because pocket gophers rarely venture aboveground (Clark and Stromberg 1987), mortality due to collisions is unlikely. Since much of the project area is tilled annually and since the project footprint in untilled land would be small, the potential for destruction of burrows is low. During operation, some habitat would be lost for the life-of-project; there would also be potential for collisions with vehicles for the life-of-project.

Swift fox are probably rare visitors to the project area, and thus potential for impacts to this species is low.

3.7.2.5 Impacts of the No Action Alternative

Under the No Action Alternative, no federal- or state-listed species would be impacted by the project.

3.7.2.6 Mitigation Measures

SCE would use state-of-the-art turbine technology, including large unguyed turbines with tubular towers, slow-moving rotors, and perching surfaces, thus reducing the potential for bird collisions. The power lines would be designed per the *Suggested Practices for Raptor Protection on Power Lines--the State of the Art in 1996* (Avian Power Line Interaction Committee 1996) to avoid potential electrocution impacts. SCE has designed the project to avoid the area's black-tailed prairie dog colonies. Prior to construction, the two colonies within the survey corridors would be searched for burrowing owls and their sign, and if they occur in the colony, construction may be delayed within 0.5 mi of the colony until after the nesting season (August 1). SCE would conduct a raptor nest survey prior to construction, and any active nests would be avoided by an appropriate buffer until the chicks have fledged or the nest fails. SCE would conduct mountain plover surveys in all potential habitat prior to construction, and, if nests are found, SCE would avoid construction within 0.25 mi of a nest until the chicks are mobile (about 35 days after the nest is discovered or 7 days post-hatching) unless otherwise approved by Western. Employees would be instructed on how to identify mountain plover and to avoid driving in areas where plover are seen until the area has been inspected for nests by a qualified biologist.

3.8 CULTURAL RESOURCES

3.8.1 Environmental Setting for the Proposed Project

The Spring Canyon wind project is situated within the Great Plains Province of the Platte River Basin Colorado prehistoric context area (Gilmore et al. 1999). Human occupation of this region dates back to the Paleoindian Stage (12,000-7,500 years before present [B.P.]). This stage refers to a subsistence system in which people utilized now-extinct megafauna including mammoth and bison. Clovis, Folsom, and Plano occupations, although scant, are found in northern Colorado in the Great Plains Province, mostly south and west of the current project area. Site settlement patterns suggest that Paleoindian occupations favored river terraces, although some sites are situated in sand dune locales (Gilmore et al. 1999:83).

The Archaic Stage follows the big game hunting of the Paleoindian Stage (7,500 years B.P.-AD 50). This stage is characterized by a broader subsistence spectrum including collecting of plant resources, as evidenced by numerous grinding stones found at Archaic Stage sites, and small game hunting. The Archaic Stage of the Platte River Basin of Colorado is divided into Early, Middle, and Late Archaic periods. Based on radiocarbon age frequencies, the Great Plains Province has a greater number of sites dating to the Middle and Late Archaic periods. A number of Archaic Stage site types have been identified for this region, including open and sheltered lithic scatters, camps, and architectural sites; quarries; kill sites; game processing and butchering sites; ceremonial sites; burials; and rock art. Research topics and data needs for the Plains area of northeastern Colorado include chronological refinement and the relationship between the Archaic and Paleoindian as well as the Archaic and the Late Prehistoric, refinement of projectile point typologies such as McKean and Mountain Side-Notched, lithic source identification, and subsistence and seasonality studies.

The final prehistoric period for this region of Colorado is the Protohistoric Stage (AD 1540-AD 1700). At about AD 1500, the Plains area of Colorado returned to a more normal climatic condition after several hundred years of drought, leading to a repopulation of this area. Protohistoric site types are mostly open camps and lithic scatters, although other types including stone circle habitations, rock art, battlefields, trails, and peeled trees have been noted. Apache

and Kiowa groups, among others, who migrated south from Canada, entered the northern and Central High Plains as nomadic hunter-gatherers with little evidence of sedentism or agriculture. Few sites have been dated to this time period, and even fewer have diagnostic artifacts that can identify the cultural affiliation of the sites. Combined, ethnographic and ethnohistoric records can be used, in conjunction with the archaeological record, to make such determinations. However, research must focus on diagnostic artifact types and materials to identify Protohistoric sites and patterns.

During the late Prehistoric period, the Arapaho and Atsina (Gros Ventres), both of Algonquian linguistic stock, were located in the region of central and southeastern Montana. The Arapaho then migrated to the southeast, most likely pressured by the Blackfeet tribes. The Kiowa and affiliated Kiowa Apache lived near the head of the Missouri River in southwest Montana. They migrated gradually southeastward, allied for a time with the Crow, lived in or near the Black Hills, and then were gradually forced south to the southern plains by the Arapaho and Cheyenne. The Lakota Sioux claim to have driven them south out of the Black Hills (Swanton 1952:295, 386-387). The Northern Cheyenne migrated westward from Minnesota after 1700, and by 1800, they allied with the Lakota Sioux and ranged throughout the region of the headwaters of the North Platte and Yellowstone Rivers (Swanton 1952:279).

The Northern Cheyenne and Northern Arapahoe migrated south to the region surrounding the project area in the latter part of the eighteenth century. Their use of the area as highly mobile equestrian plains hunters focused almost exclusively on the bison economy supplemented by wild fruits, berries, and other plant resources in the riparian areas that dotted the plains. Fur trade journals and published reports from early nineteenth-century U.S. Army topographic expeditions documented the use of the region by the Northern Cheyenne and Northern Arapahoe (e.g., Fremont 1845; Stansbury 1852). Their migratory use of the northern Colorado plains continued until the reservation period following 1870. The Pawnee, one of the principal tribes of the caddoan linguistic stock, occupied regions to the east along the Platte and Republican Rivers (Swanton 1952). Early to mid-nineteenth-century Native American site types likely to occur in the region include stone circle camps or ceremonial sites, lithic scatters and hearth features, and marker or driveline cairns.

Territorial boundaries of tribal and band-level societies on the northern plains were in a constant state of flux during the Protohistoric period and into the early 1800s. The northward diffusion of the horse from the southwest reached the northern plains in the eighteenth century (Haines 1938). In turn, the southern diffusion of the gun and other fur trade merchandise from the northeast and upper midwest reached the plains in the same century. Both the horse and gun were acquired by some tribes sooner than others, depending on the tribe's proximity to the source and intertribal trade patterns. Acquisition of the horse by Northwestern Plains tribes during early to mid-eighteenth century increased mobility and carrying capacity, and both the horse and gun altered the military balance of power, especially for those tribes that acquired both early, such as the Blackfeet and the Crow (Secoy 1953). As a result, migratory patterns of subsistence throughout the Northwestern Plains region were influenced by these events.

After the close of the Civil War and construction of the transcontinental railroad in 1865 and 1869, respectively, the northeastern plains of Colorado were open for homesteading during the post-war period of United States western expansion. By the end of the century, Logan County was well-settled and dotted with farmsteads and ranches practicing dry land and irrigated farming techniques. Historic sites likely to occur in the region include, but are not limited to, the remains of homesteads, cabins, corrals, water wells, windmills and tanks, outbuildings and foundation imprints.

A file search was conducted at the Colorado Historical Society on October 14, 2004, for all of the sections for the proposed project area within Townships 11N and 12N, Ranges 50W and 51W. A supplemental file search was conducted on March 29, 2005. The file searches indicate that three cultural resource inventories have been conducted and four sites have been recorded. The previous inventories were conducted for two pipelines (the Trailblazer Pipeline in 1981 [Weir and Hunt 1981] and the KN Nebraska-Colorado Pipeline in 1991[Travis and O'Brien 1991]) and one transmission line (the Sidney to North Yuma 230-kv transmission line [Jepson 1991]). While these linear projects were quite lengthy, the portions that overlapped with the currently proposed project area are small ranging in width from 100 to 200 ft. The expectation of these previous inventories was to find prehistoric open camps and lithic scatters and historic trash scatters. Historic ranches were not expected due to the design of these projects to avoid such resources. The 1981 Trailblazer Pipeline recorded two prehistoric sites and four prehistoric

isolates in Colorado. The 1991 KN Nebraska-Colorado Pipeline recorded no cultural materials in Colorado. The 1991 Sidney to North Yuma 230-kv transmission line recorded six prehistoric sites and eight prehistoric isolates in Colorado.

The four sites recorded in the currently proposed project area include three historic sites and one prehistoric site. The three historic sites are recommended as not eligible for listing on the NRHP. They consist of the Peetz Water Tank (Site 5LO211), the J.R. Portner House (Site 5LO274), and the Wood House (Site 5LO275). These three sites are not associated with any accessioned projects and were recommended as not eligible to the NRHP due to the lack of structural integrity at the time of the inventory. The prehistoric site (Site 5LO286) is an open camp and lithic scatter that is recommended as not eligible for the NRHP due to its lack of intact subsurface archaeological deposits and moderate disturbance to the site. The site was recorded during the inventory for the Sidney to North Yuma 230-kv transmission line. Chert and quartzite debitage was found with no diagnostic artifacts noted. In addition, two prehistoric isolated finds (5LO190 [recorded during the inventory of the Trailblazer Pipeline] and 5LO281[recorded during the inventory for the Sidney to North Yuma 230-kv transmission line]) have been determined as not eligible for the NRHP. Based on the file search, no TCPs are known to occur within the project area. The Class III inventory, while not specifically attempting to identify TCPs, did not locate cultural features usually associated with Native American sensitive sites (e.g., stone circles, rock cairns or alignments, or rock art). No interviews were conducted with local groups, individuals, or tribes. However, Western sent letters to 13 tribal entities requesting their interest or issues for the proposed project. To date, only the Oglala Sioux tribe responded that they would have a formal response in February. No such response was forwarded to Western.

General Land Office (GLO) plat maps, Master Title Plats, and historical indices, for Townships 11N and 12N, Ranges 50W and 51W were reviewed. These documents indicate that homesteads dating to the second decade of the twentieth century are present in the project area.

A Class III inventory for the Spring Canyon wind project was conducted between February 19 and April 3, 2005, within the 2,000-ft wide survey corridor, as well as the 50-ft corridor (see Figure 2.1). The inventory resulted in the identification of 14 newly recorded prehistoric and

nine newly recorded historic sites, as well as 43 isolated finds. All of the newly recorded sites are recommended as not eligible for listing on the NRHP. Previously recorded NRHP-ineligible prehistoric Site 5LO286 could not be relocated during the inventory. No Traditional Cultural Properties (TCPs) are known to occur within the project area, and no TCPs were identified during the current inventory.

3.8.2 Environmental Impacts and Mitigation Measures

3.8.2.1 Significance Criteria

Impacts to cultural resources would be considered significant if any cultural resource site eligible for the NRHP is disturbed during construction or operation of the wind project.

3.8.2.2 Impacts of the Proposed Project

No NRHP-eligible cultural resource sites were identified during the current Class III cultural resource inventory for the project. The nine historic and 14 prehistoric sites recorded during the inventory are all recommended as not eligible for the NRHP. No TCPs are known to occur within the project area, and no TCPs were identified during the current inventory. Because the sites are recommended as not eligible for the NRHP, construction activities would have no project effect on these cultural resources.

If a previously undiscovered site or TCP is exposed and discovered during construction, all activity would be halted. The site would be inspected and evaluated by Western to determine if the site is eligible for the NRHP and the treatments necessary--in consultation with SCE and the SHPO--to avoid further impacting the site. This standard approach to handling unanticipated cultural resource discoveries within the project area would ensure that impacts to cultural resources due to the proposed project would not be significant.

3.8.2.3 Impacts of the No Action Alternative

No impacts to cultural resources would occur under the No Action Alternative.

3.8.2.4 Mitigation

No additional mitigation is proposed.

3.9 LAND USE, TRANSPORTATION, AND RECREATION

3.9.1 Environmental Setting for the Proposed Project

Land use within the project area is primarily agricultural, with dryland wheat and millet the principal crops. Large areas of CRP land also occur in the project area (see Section 3.5.1). A few areas of native prairie, used for livestock grazing, also occur. Other land uses include transportation (roads and pipelines), power transmission, residential use, and recreation (big game and pheasant hunting). Colorado State Highway 113 on the western side of the project area and an extensive network of gravel-surfaced county roads has been constructed throughout the project area. There are no state or national parks, Wild and Scenic rivers, or other areas of recreational, scenic, or aesthetic importance in the project area. Since the project area is entirely located on private land, recreation is generally limited to the landowners themselves or granted to others by the landowners, except for use of the county roads to access off-site recreational areas (which are limited because most of the region is privately owned). One landowner conducts guided pheasant hunts, and big game is hunted with landowner permission.

There are two recreational vehicle (RV) parks in the Sterling area—North Sterling State Park and Yogi Bear's Jellystone Park that, combined, offer 131 private camp sites and 30 hook-up sites for RVs (Logan County Chamber of Commerce 2005a, 2005b). Other camping areas include Prewitt Reservoir, Tamarack Ranch Wildlife Area, Jumbo Reservoir, and Crow Valley Recreation Area. Fleming City Park in Fleming, Colorado, also offers camping. There are three

RV parks near Sidney, Nebraska--Cabela's RV Park and Full Service Campground, Point of Rocks Motel and RV Park, and Bear Family RV Park (Sidney Chamber of Commerce 2005).

Bounded on the north by Interstate 80 (I-80) and on the south by I-70, and bisected by I-76, northeastern Colorado has excellent transportation services (Northeastern Colorado Economic Developers 2004). State Highway 113 forms the western boundary of the project area, so there is good, improved access to the project area. Burlington Northern-Santa Fe and Union Pacific provide rail service to the region. Denver International Airport is just over an hour away.
Logan County has issued a Conditional Use Permit for the project.

3.9.2 Environmental Impacts and Mitigation

3.9.2.1 Significance Criteria

Impacts to land use, transportation, and recreation would be significant if the proposed project precluded continuation of current land uses within the area surrounding the project.

3.9.2.2 Impacts of the Proposed Project

The project would result in the initial disturbance of approximately 84 acres of shortgrass prairie, 102 acres of agricultural land, and 36 acres of CRP land. Life-of-project disturbance would include disturbance of 26 acres of shortgrass prairie, 32 acres of agricultural land, and 11 acres of CRP land. All existing land uses would continue as they are prior to development, with the possible exception of hunting, which would be precluded in the vicinity of wind turbines, transformers, and other facilities that could be damaged by ammunition fired during hunting. This may have a minor effect on a landowner's income, as well as the recreational use of the area by hunters--the income impacts would be more than offset by the rent paid by SCE. The reduction in hunting opportunity would be small.

Traffic will increase on the roads leading to and within the project area during the construction stage, as equipment is transported into the area. Large pieces of equipment such as rotor blades

are over-sized loads that may temporarily slow traffic as they are moved into the project area. This additional heavy traffic would also cause additional wear on existing roads, but transportation would be conducted in accordance with Colorado Department of Transportation Regulations and, thus, adverse impacts to roads is not anticipated. Project area roads are crowned, ditched, and graveled, and are capable of supporting heavy loads. Only minor rutting along county roads was noted during the construction of the existing wind project west of Peetz (personal communication, March 2005, with Chad Wright, Operations Manager, Logan County Road and Bridge Department, and Gary Gillham, landowner). This will be a short-term, direct impact during the construction phase. Large pieces of agricultural equipment and trucks are common in the project area so the introduction of additional large equipment associated with the wind project will have minor impact on transportation. Large pieces of equipment may occasionally impact transportation during the O&M phase but most O&M traffic will be pick-up trucks and medium-sized trucks similar to those presently used for agricultural activities. The increase in traffic will not cause a major change in the transportation network in the project area. Impacts to land use, transportation, and recreation due to the Proposed Project would not be significant.

3.9.2.3 Impacts of the No Action Alternative

Under the No Action Alternative, land use, transportation, and recreation would remain the same.

3.9.2.4 Mitigation Measures

Heavy loads would be prohibited on the gravel county roads when conditions are too wet to support traffic without creating ruts greater than 4 inches deep.

3.10 PUBLIC HEALTH AND SAFETY

3.10.1 Environmental Setting for the Proposed Project

Public access to private lands is already restricted by landowners and would continue to be restricted in accordance with easement agreements. Existing safety hazards would include traffic on county roads and Highway 113, potential for fires, and possible accidents related to agricultural activities. No public safety issues have arisen from the existing wind project west of Peetz (personal communication, March 2005, with Roger Japp, Logan County Under Sheriff).

School buses travel in the project area between 7:00 and 8:00 a.m. and between 3:30 and 4:30 p.m. (personal communication, March 2005, with Bob Long, Peetz Schools). There are about approximately eight stops within the project area and one on Highway 113. Students are transported either to the elementary school or combination middle school/high school in Peetz.

3.10.2 Environmental Impacts and Mitigation Measures

3.10.2.1 Significance Criteria

Impacts to public health and safety would be considered significant if the Proposed Action resulted in loss of life, limb, or property.

3.10.2.2 Impacts of the Proposed Project

Potential public health and safety impacts could include the following:

- traffic accidents,
- traffic accidents involving the railroad crossing in the town of Peetz,
- unanticipated fires,
- electrocution from high voltage equipment,

- interference with school buses or emergency vehicles, and
- electromagnetic interference (EMI) with local aircraft radar or television signals.

With the implementation of mitigation described below, these impacts should not occur or would be unlikely.

3.10.2.3 No Action

Under the No Action Alternative, no impacts to public health and safety would occur.

3.10.2.4 Mitigation Measures

Truck drivers, construction workers, residents, and any visitors to the project area are expected to obey traffic laws. All drivers are expected to exercise caution when crossing the at-grade railroad crossing in the town of Peetz.

All fires would be extinguished immediately by SCE personnel, if there is no danger to life or limb, and the appropriate landowner and the county sheriff's department would be notified immediately. Some fire-fighting equipment would be located in vehicles and in the O&M facility. If the fire cannot be extinguished by SCE personnel, the landowner and sheriff would be so advised. Fire deterrents within the wind farm would include access roads, which may serve as fire breaks and regular clearing of vegetation from areas around transformers, riser poles, and buildings.

The substation would be fenced as required for public safety, but no other fencing is proposed at this time.

Safety signing would be posted around all towers, where necessary, transformers, and other high voltage facilities, and along roads, in conformance with applicable state and Federal regulations.

In the event that the project results in impact to radar, microwave, television, or radio transmissions, SCE will work with the owner of the impacted communication system to resolve the problem. Potential mitigation may include realigning the existing antenna or installing relays to transmit the signal around the project (BLM 2004). Additional warning information may also need to be conveyed to aircraft with onboard radar systems so that echoes from wind turbines can be quickly recognized.

The FAA requires a notice of proposed construction for a project so that it can determine whether it would adversely affect commercial, military, or personal air navigation safety (BLM 2004). The proposed project would meet all appropriate FAA criteria, so no adverse impacts to aviation would be expected.

3.11 NOISE

3.11.1 Environmental Setting for the Proposed Project

The A-weighted decibel scale (dBA scale) measures sound levels over the entire range of audible frequencies, weighted to accommodate the fact that humans hear middle range frequencies better than high or low frequencies. The dBA of commonly heard sounds is presented in Table 3.6.

The project area is rural farmland and native prairie, with homesteads, agricultural activities, state and county roads, and the wind as the major contributors to ambient noise levels. Ambient noise levels are likely in the range of 20-55 dBA (BLM 1995; British Wind Energy Association 2004), depending on time of day and proximity to human activities, State Highway 113, or the railroad. Noise levels within the project area are likely lowest during the morning and at night

Table 3.6 Noise Levels of Commonly Heard Sounds.[1]

Source/Activity	dBA
Threshold of hearing	0
Rural night-time background	20-40
Quiet bedroom	35
Wind project at 1100 ft	35-45
Car at 40 mph at 300 ft	55
Busy office	60
Truck at 30 mph at 300 ft	65
Jet aircraft at 800 ft	105
Threshold of pain	140

[1] Source: British Wind Energy Association (2004). dBA = A-weighted decibels.

(e.g., 20-40 dBA) when wind speeds are lower, and highest (e.g., 55 dBA) in the afternoon when wind speeds are higher. A truck operating at 30 mph generates about 65 dBA at a distance of 300 ft; farm equipment likely is somewhat noisier. Passenger cars traveling 50 mph generate about 65 dBA at 50 ft and diesel trucks generate about 85 dBA at 50 ft, so near State Highway 113, traffic noise levels are likely in the range of 65 to 85 dBA. Noise levels drop with the square of distance from the source (Figure 3.10), so noise levels at 200 ft from Highway 113 would be about one-quarter of levels at 100 ft.

Noise-sensitive receptors within the project area are residences and wildlife. SCE has designed the project so that all turbines are at least 1,000 ft from the nearest residence--one exception has been granted by a landowner to permit a turbine to be located within about 900 ft from his residence. The nearest known raptor nest is within about 900 ft of a turbine. The proposed substation would be located about 2,000 ft from the nearest residence and approximately 0.6 mi from the nearest known raptor nest.

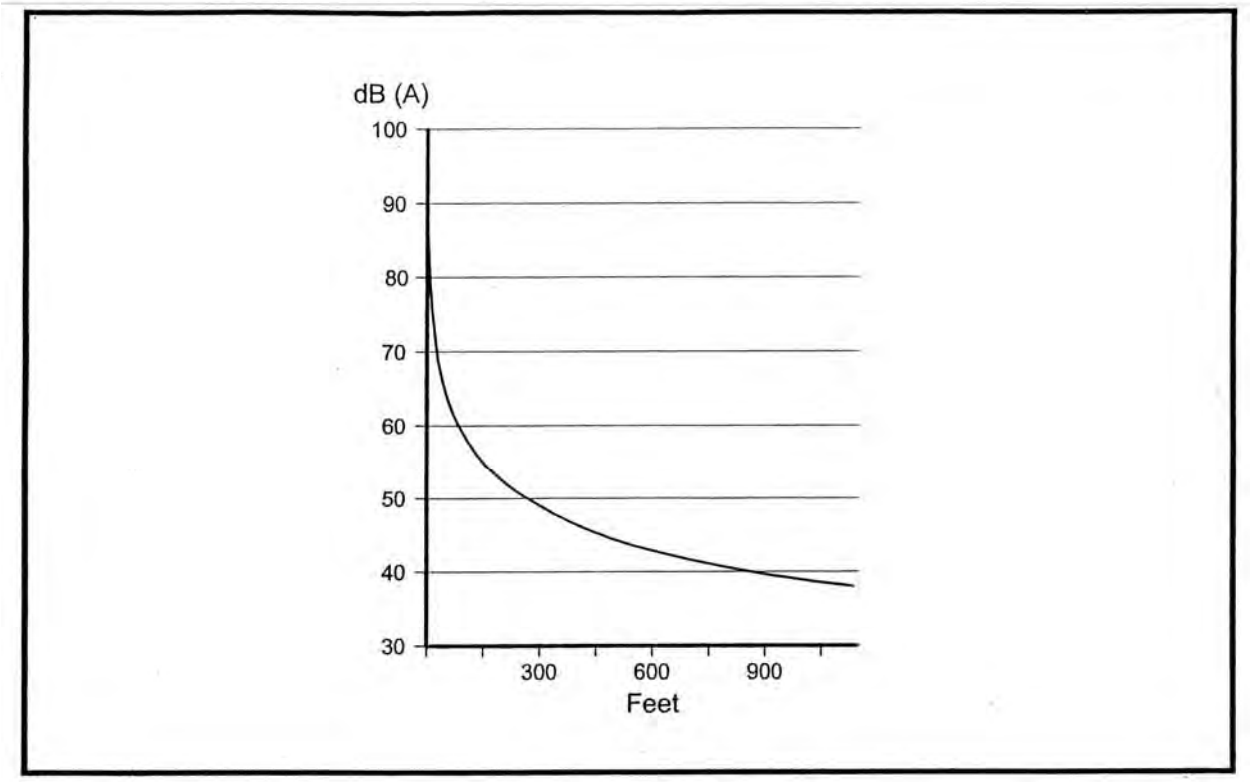

Figure 3.10 Noise Levels and Distance from the Source.

3.11.2 Environmental Impacts and Mitigation Measures

3.11.2.1 Significance Criteria

Impacts from noise would be considered significant if the project's operation resulted in regular annoyance to the area's residents.

3.11.2.2 Environmental Impacts

Construction noise will exceed ambient noise levels and may be heard for some distance within the project area. Truck traffic, heavy equipment, and possibly foundation blasting would cause

elevated noise levels at and near construction sites. These impacts will be moderate, probably disrupting residents and wildlife during construction hours, but temporary and similar to noise present as a result of the operation of agricultural equipment throughout the project area. SCE will minimize construction noise impacts by ensuring that construction equipment is maintained and properly muffled, limiting the amount of equipment on-site to that which is necessary for construction, and limiting construction activities to daytime hours.

Noise impacts associated with operations are expected to be minimal to humans. At the base of a wind turbine, it should be possible to have a conversation without raising one's voice (American Wind Energy Association [AWEA] 2004a). At the nacelle, the wind turbines proposed for this project generate about 100 dBA, depending on wind speed. At one rotor distance (150 ft) from typical wind turbine, noise levels are 55-60 dBA. At four rotor distances (about 600 ft), noise levels are about 44 dBA, and at six rotor distances (900 ft), turbine noise is about 40 dBA.

Both the nearest residence and the nearest known raptor nest are approximately 900 ft from the nearest wind turbine, so wind turbine noise levels would be about 40 dBA, similar to rural night-time ambient noise levels.

Modern turbines emit a swishing or whooshing noise that is caused as rotors encounter turbulent air. Most of the hum or whine and the thumping noises generated by older model turbines have been eliminated in modern turbines.

Generally, the sound of the wind will mask turbine noise, especially since turbines only operate when wind speeds reach a certain threshold. SCE will use state-of-the-art turbines that have been designed to minimize noise levels (e.g., upwind rotors, thinner blade tips, streamlined towers and nacelles), so it is anticipated that wind turbine noise impacts to residents and wildlife would not be significant. Landowners near the existing wind project west of Peetz occasionally hear the turbines but do not find them annoying (personal communication, March 2005, with Gary Gillham, landowner). Noise from trains in Peetz is louder than from the existing wind project.

Substations emit both transformer noise and switchgear noise. Transformers emit a low-frequency humming noise (caused by vibrations within the transformer) that is generally between 43 dBA (for a 60-MW project, roughly equivalent to the Phase I project) at a distance of about 500 ft (BLM 2004). Substation noise at 150 ft for a 160-MW project (slightly larger than the full build-out) would be about 46 dBA. These noise levels at about 1,640 ft would be 33 and 36 dBA, respectively, so substation noise levels at the nearest residence and nearest known raptor nest would be below ambient levels.

Because wind turbine and substation noise would be at or below ambient levels at the nearest residences, noise impacts to residents would not be significant.

3.11.2.3 Impacts of the No Action Alternative

Under the No Action Alternative, the area's noise levels would not change due to the project.

3.11.2.4 Mitigation Measures

No additional mitigation is proposed.

3.12 VISUAL RESOURCES

3.12.1 Environmental Setting of the Proposed Project

The area exhibits a typical rural setting with both occupied and abandoned farmsteads scattered along gravel roads throughout the landscape, which is a mixture of tilled and CRP agricultural fields and native grassland used as pasture. Many farmsteads have shelterbelts around the perimeter. Buildings within Peetz, particularly the grain elevators, dominate the view west of the project area, and the landscape already has a significant wind power component in the existing wind project west of Peetz. The landscape is characteristically flat to rolling, with the green and brown colors of the agricultural fields, linear features such as roads and transmission lines, and it is punctuated with the galvanized steel of grain elevators. The area is not within

sight of any highly sensitive visual elements (e.g., Pawnee National Grassland), and the visual elements of proposed project area are quite common in eastern Colorado.

3.12.2 Environmental Impacts and Mitigation

3.12.2.1 Significance Criteria

Impacts to visual resources would be considered significant if construction of the wind project would result in high visual contrasts in highly sensitive or visually unique areas in proximity to high to medium numbers of high sensitivity viewers.

3.12.2.2 Environmental Impacts

The wind turbines would change the aesthetics of the landscape with the addition of more tall towers and rotating blades--whether this effect is deemed a beneficial or adverse effect depends on viewer perspective and sensitivity. The proposed wind project probably would be more visible than the existing wind project west of Peetz because the turbines would be taller and there would be more of them.

Figures 3.11-3.14 provide visual simulations of the project from four vantage points--two views from south of Peetz on Highway 113, one view from Peetz, and one view from west of Peetz. Figure 3.15 shows visual simulation locations. The visual simulations were developed based on the dimensions of a typical wind turbine (Figure 2.2) and proposed turbine locations in UTM coordinates. The turbines were simulated facing northwest, since prevailing winds are from the northwest and these would be upwind turbines.

The substation, access roads, overhead power lines, vehicles, and dust would also impact visual resources. The substation would be viewed most frequently by local landowners, and it would represent an industrial facility in a rural landscape. The project area already contains 41.4 mi of roads; construction of approximately 26 more miles would constitute a 63% increase in the

number of roads in the project area. During construction, vehicles and dust would be a fairly constant presence in the project area; during operation, vehicle traffic would be only slightly more than current traffic levels.

The AWEA recently sponsored a series of meetings to develop recommendations improving aviation safety while allowing wind development to proceed (AWEA 2004). Current FAA requirements for wind turbine lighting typically includes red, simultaneously pulsating night-time lighting and no daytime lighting (white towers are sufficiently conspicuous to pilots). Red night-time lights are less intrusive to humans than white night-time lights (AWEA 2004b). SCE is preparing a lighting plan to meet FAA requirements while minimizing the number of lights for the project.

3.13 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.13.1 Environmental Setting for the Proposed Project

For the purposes of this EA, the area of potential effect for socioeconomic impacts includes the towns of Peetz and Sterling, Colorado; Sidney, Nebraska; and Logan County, Colorado.

The project area is located in a rural, agricultural area east of Peetz, in Logan County, Colorado. In 2000, the population of Peetz was 227 (Wikipedia 2004a). The town contains 99 housing units, with 90 households and 63 residing families. The population is predominantly white (95.6%); minorities make up 15.0% of the population. (The demographic data for minorities include white and non-white Hispanics and Latinos, so totals will be more than 100%.) Median age is 37 years. Median household income is $42,083; median family income is $47,614. Per capita income is $19,172. An estimated 7.3% of the population and 4.3% of families are below poverty level.

Sterling, Colorado, is located approximately 25 mi south of the project area. In 2000, Sterling's population was 11,360 (Wikipedia 2004b). Sterling has 5,171 housing units with 4,604

households and 2,790 families residing in the city. The population is predominantly white (90.8%), with 22.7% minorities. Median age is 35 years. Median household income is $27,337; median family income is $39,103, and per capita income is $15,287. An estimated 15.2% of the population and 11.5% of the families are below poverty level.

Sidney, Nebraska, is located approximately 10 mi north of the project area. In 2000, Sidney's population was 6,282 (Wikipedia 2004c). Sidney had 2,890 housing units, with 2,621 households, and 1,672 families residing in the city. The population is predominantly white (95.22%) with 10.7% minorities. Median age is 38 years. Median household income is $33,935; median family income is $41,050, and per capita income is $17,158. An estimated 9.0% of the population and 7.0% of the families are below the poverty level.

Logan County's population is an estimated 20,928 (U.S. Census Bureau 2004), and Sterling is the main population center. Population density is about 11.2 persons/square mi. Population increased by 16.7% between 1990 and 2000. In 2002, there were 8,623 housing units in Logan County, and homeownership rate was 69.9%. There are an estimated 7551 households, with a median household income of $32,724. Logan County's population is predominantly white (91.7%), with minorities comprising 15.6% of the population. An estimated 12.2% of the population is below poverty level.

Northeastern Colorado has a large pool of skilled workers (Northeastern Colorado Economic Developers 2004). Farm households have substantially higher levels of job-related skills than non-farming households, including welding, small and large engine repair, computer use, large and small animal care, agriculture/gardening, and machining.

Each Federal agency is to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations" (Executive Order 12898, Federal Actions to Address Environmental Justice

in Minority Populations and Low-Income Populations, February 1994, 59 *Federal Register* [FR] 7629).

The Presidential Memorandum accompanying the Executive Order directs Federal agencies to "analyze the environmental effects, including human health, economic and social effects of Federal actions, including effects on minority communities and low-income communities when such analysis is required by the National Environmental Policy Act."

EPA defines environmental justice as "The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies."

In addition, the Council on Environmental Quality provides input on NEPA compliance with Executive Order 12898 in its Environmental Justice Guidance under NEPA, December 1997.

Low income communities are defined by EPA as communities where the percentage of the population below poverty level is greater than the state average. Currently, 9.3% of Colorado's population is below poverty level. In Peetz, only 7.3% is below the poverty level; thus, Peetz is not a low-income community. In Sterling, 15.2% of the population is below the poverty line, so Sterling would be considered a low-income community. Only 7.0% of Sidney's population is below the poverty level (Nebraska's average is 9.7%) so Sidney is not classified as a low-income community.

Minority communities are defined by EPA as communities where the percent of minorities is larger than the state average. Colorado's minorities make up 25.5% of the state's population. Minorities make up 15.0% of Peetz population, so Peetz is not a minority community. The

minority population of Sterling is 22.7% and in Logan County, minorities make up 15.6% of the population. Sidney's population consists of 10.7% minorities, whereas Nebraska's average is 12.7%.

3.13.2 Environmental Impacts and Mitigation Measures

3.13.2.1 Significance Criteria

Impacts to socioeconomics would be considered significant if project-related population increases result in housing or public service demands that could not be met by existing or currently planned facilities. Impacts related to environmental justice would be considered significant if the project caused disproportionately high impacts on low-income or minority communities.

3.13.2.2 Impacts of Proposed Project

Approximately 20 people per day for 180 days would be required for wind project construction. Substation construction would require approximately 5 people for 90 days. Reclamation would require about 4 people for 30 days. Most construction workers are expected to commute from Sterling, Colorado; Sidney, Nebraska; and possibly Cheyenne, Wyoming, and surrounding areas. Specialty construction workers, with specific wind power construction experience, would come from out-of-state, and the out-of-state work force is expected to be about 50% or about 12 workers, who would likely commute to either Sidney or Sterling during the construction period. Sterling has 585 vacant housing units (Wikipedia 2004b) and over 175 hotel rooms (Trip Advisor 2004a). Sidney has 498 vacant housing units (Wikipedia 2004c) and over 205 hotel rooms (Trip Advisor 2004a). There is adequate housing and associated infrastructure to support the 12 additional workers during the construction period. No new infrastructure would be required.

Because additional workers would be in the area and because there would be an increase in traffic, the project would result in small increase in need for additional law enforcement; however, no public safety issues were noted during construction of the existing wind project west of Peetz (personal communication, March 2005, with Roger Japp, Logan County Under Sheriff).

The project would generate sales and use taxes for goods and services purchased during construction and operation (Table 3.7). It would also provide property taxes to the town of Peetz and to Logan County. The project would employ 25 workers during construction and would create 8-10 permanent O&M jobs. All of these impacts would be beneficial to the affected towns/cities, to Logan County, and to the State of Colorado. Logan County and the City of Sterling are low-income communities in the area of potential effect, but the project is expected to generate revenue needed by the county and the city, so no adverse effects to low-income communities would occur. Furthermore, the project would generate revenue for the private landowners on whose land the project is located, further benefiting the area's economy.

The following discussion of wind development impacts on property values was excerpted from the U.S. Bureau of Land Management's Draft Programmatic Environmental Impact Statement on Wind Energy Development of BLM-Administered Lands in the Western United States (BLM 2004).

Table 3.7 Expected Revenues to Local Landowners and Governments from the Proposed Project.

Source of Revenue/Benefit	**Estimated Amount of Revenue/Benefit (Life-of-Project)**
Sales, use, and property taxes	$12,800,000
Landowner income	$9,400,000
Construction employment	25 temporary full-time jobs
O & M employment	8-10 permanent full-time jobs

> The potential impact of wind development projects on residential property values has often been a concern in the vicinity of locations selected for wind power. Although this PEIS does not directly assess the potential impacts of wind power on property values, a review of two studies that examined potential property value impacts of wind power facilities suggests that there would not be any measurable negative impacts.
>
> ENONorthwest (2002) interviewed county tax assessors in 13 locations that had recently experienced multiple-turbine wind energy developments. While not all the locations chosen had wind turbines that were visible from residential areas, and some development projects had been constructed too recently for their full impact to be properly assessed, the study found no evidence that wind turbines decreased property values. Indeed, in one area examined, it was found that designation of land parcels for wind development actually increased property values.
>
> Sterzinger et al. (2003) analyzed the effects of 10 wind energy development projects built during the period 1998 to 2001 on housing sale prices. The study used a hedonic statistical framework that attempted to account for all influences on changes in property value; its data came from sales of 25,000 properties, both within view of recent wind energy developments and in a comparable region with no wind energy projects, before and after project construction. The results of the study indicate that there were no negative impacts on property values. For the majority of the wind energy projects considered, property values actually increased within the viewshed of each project, with property values also tending to increased faster in areas with a view of the wind turbines than in areas with no wind projects.

As with mineral rights, property owners in the area hold wind power rights to increase property values.

3.13.2.3 Impacts of No Action Alternative

Under the No Action Alternative, the affected towns/cities, Logan County, and the State of Colorado would not realize the sales and use or property taxes potentially generated by the wind project, and private landowners would not realize the additional income from easements on their property.

3.13.2.4 Mitigation Measures

No mitigation is proposed.

3.14 CUMULATIVE IMPACTS

Cumulative impacts are the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor to collectively significant actions taking place over a period of time (C.F.R. 1508.7).

The natural, human, and cultural environment within the project area and in the general region has been substantially altered by the long-practiced agricultural activities, especially crop production, which is widespread in the project area. The major agricultural activities have resulted in widespread conversion of shortgrass prairie to farmland and rural residential development. Other developments that have affected the project area and the region include another wind project (about 35 turbines); transportation (roads, highways, railroads, pipelines, transmission lines); small towns with businesses to provide goods and services to the rural communities; and water development (e.g., irrigation ditches, wind mills, stock ponds). Western's 230-kV Sidney to North Yuma transmission line bisects the project area. Other wind developments may be leasing land within the region, but no applications have been filed with Logan County (personal communication, March 2005, with Dustin McCormick, Logan County), so specific development plans are not currently known. SCE may opt to lease additional lands for future expansion of the Spring Canyon wind project, but other than the completion of the 130-MW project described herein, no foreseeable development is proposed. No reasonably foreseeable future developments are known, so the cumulative impacts assessment includes the Proposed Action and the above-referenced management activities and developments.

3.14.1 Climate and Air Quality

Cumulative impacts to climate and air quality would be similar to those described for the Proposed Action. Climate would not be incrementally impacted by the project. Air quality would be slightly impacted during construction and operation. In addition, cumulative impacts of the two wind projects would produce more electric power from a non-polluting source. Cumulative effects of the two wind projects would produce electric power from a non-polluting source, resulting in a small incremental improvement in air quality when compared to burning coal for electric power. However, the air quality improvement would not necessarily occur within the project area.

3.14.2 Geology, Paleontology, and Soils

Cumulative impacts to geology would include excavation in bedrock to dig the turbine foundations, as described for the Proposed Action.

Other excavation in the Ogallala formation has the potential to impact paleontologic resources, and the project would contribute minimally to cumulative impacts to paleontology. If the project is determined not likely to uncover important fossils, cumulative impacts would be minor. However, there is potential to uncover scientifically important fossils, excavation would be monitored by a qualified paleontologist, any discoveries would be recorded and preserved, as appropriate, and impacts would be beneficial due to the contribution to the paleontological record.

Soils have already been highly impacted by farming and other agricultural activities. The proposed project would disturb up to 222 acres of soils, most of which are already disturbed. Therefore, cumulative impacts to soils would be negligible.

3.14.3 Water Resources

Cumulative impacts to surface water quantity would be minimal because any surface waters used would be obtained from existing permitted sources and would not impact other users. The amount of surface water used would be minor compared to the amount used regionally for irrigation (Topper et al. 2003). Cumulative impacts to surface water quality is already largely affected by agricultural activities, including wind and water erosion from plowed fields and irrigation return water. Dust from traffic on the area's gravel roads and railroads, maintenance on the pipelines and power lines, and residential and commercial activities (including O&M on the existing wind project) all contribute small amounts of sediment to surface waters. The project would result in the disturbance of up to 222 acres during construction; however, SCE would use best management practices to minimize erosion and downstream sedimentation, so the incremental impact to surface water quality would be minimal.

Existing wells in the project area are used for irrigation, stock watering, and domestic use and, in northern Colorado, water levels in the Ogallala aquifer have dropped about 10 ft between 1990 and 2000 (Topper et al. 2003). The project would consume 2,798,375 gallons of water (surface and/or ground water) from existing permitted sources for foundation concrete and dust control during construction (see Section 2.2.7). The project would contribute only slightly to ground water consumption. Ground water quality in the project area would not be impacted, and cumulative ground water quantity or quality impacts are anticipated to be minimal.

3.14.4 Floodplains and Wetlands

The project would not impact floodplains or wetlands. As noted in Section 3.4, many floodplains and wetlands within the project area are farmed and thus previously impacted. The Proposed Action would not cause significant cumulative impacts to floodplains or wetlands.

3.14.5 Vegetation

Vegetation within the project area is largely cropland (12,660 acres), with a few areas of native prairie (7,094 acres), and CRP land (2,300 acres). The proposed project would create up to 222 acres of disturbance--84 acres of native prairie, 102 acres of cropland, and 36 acres of CRP land, so the incremental increase in vegetation disturbance would be minor. Cumulative impacts to vegetation would not be significant.

3.14.6 Wildlife

Cumulative impacts to wildlife would be similar to those described for the Proposed Action because land use within and adjacent to the project area is subject to regular human activity from farming and ranching activities. Large tracts of native habitat have been replaced with cropland which provides non-native habitat for some species while displacing other species. The CRP land, rangeland, and grasslands in the region provide habitat for a wide number of species; however, existing human disturbance and activity adversely impact some species. Black-tailed prairie dog, burrowing owl, mountain plover, ferruginous hawk, and swift fox are shortgrass prairie species that are now state-listed species due to widespread loss of shortgrass prairie habitat. The project would disturb up to 222 acres of habitat, of which 84 acres would be native prairie, 102 acres would be cropland, and 36 acres would be CRP land. Therefore, the proposed project would contribute only minimally to habitat loss and, cumulatively, would not significantly impact wildlife.

Direct cumulative impacts to avifauna (i.e., collision-related mortality) would result from the presence of above-ground features such as communications towers, grain elevators, transmission lines, vehicles on highways, windows, and the two wind projects, as well as mortality caused by other factors (e.g., house cats) (NWCC 2001). However, mortalities at wind projects has been documented to be low compared with other sources of mortality (Table 3.2) (NWCC 2001), and, while the project probably would cause some mortality, collisions are anticipated to be rare events and thus not significant.

3.14.7 Special Status and Sensitive Species

Cumulative impacts to special status species would be similar to those described for the Proposed Action. All development activities must comply with the *Endangered Species Act*, which requires avoidance or mitigation for impacts to TEP&C species, so no significant cumulative impacts to T&E species would occur. By avoiding black-tailed prairie dog colonies, the project would have minimal to no impacts on state-listed species. Cumulatively, the region's agricultural activities have had greater impact on habitat than other developments, and most of the project's disturbance would occur on previously disturbed land, so the project would not cause a species to be petitioned for listing under the *Endangered Species Act*. Cumulative impacts to special status and sensitive species would not be significant.

3.14.8 Cultural Resources

No NRHP-eligible cultural resource sites were identified during the current Class III cultural resource inventory for the project, so no significant cumulative impacts to cultural resources would occur.

3.14.9 Land Use, Transportation, and Recreation

Wind power generation also occurs as a land use to the west of Peetz, so the proposed project would add incrementally to the extent of electric generation in the area. Other land uses would be impacted only slightly (e.g., a loss of about 222 acres of cropland, CRP land, and native prairie) and cumulatively, would not be significant. Traffic would increase, but the overall transportation system should be able to handle project-related traffic along with the other uses without significant adverse effect. Construction of the wind project west of Peetz resulted in minor rutting on gravel roads within the wind project, but no unacceptable road damage occurred (personal communication, March 2005, with Chad Wright, Logan County Road and Bridge Department). Recreational opportunities are presently controlled and will continue to be controlled by the private landowners and, thus, the project would not cause cumulative impacts to recreation.

3.14.10 Noise

Noise impacts are anticipated to be negligible, such that at distances of approximately 1,000 ft or more from the turbines, the area would not be any noisier than under current conditions. Cumulative impacts due to noise would not be significant.

3.14.11 Visual Resources

Cumulative impacts to visual resources would be similar to those described for the Proposed Action. The project would be the second wind project in the area and, thus, is compatible with the existing landscape. Cumulative impacts on visual resources would not be significant.

3.14.12 Socioeconomics and Environmental Justice

The project's socioeconomic impacts would be beneficial to the local landowners, the town of Peetz, neighboring cities, Logan County, and the State of Colorado. Cumulative impacts also would be beneficial. Cumulative development in the general area would not impact any low income or minority communities because 1) no minority communities, as defined by EPA, occur in the region and 2) Logan County and Sterling may be classified as low income, but economic/infrastructure development would have beneficial impacts to both entities.

3.15 UNAVOIDABLE ADVERSE EFFECTS

The mitigation measures incorporated in the project description and within the various mitigation sections in this chapter would avoid or minimize many of the potential adverse effects. Unavoidable adverse effects--residual impacts that would likely remain after mitigation--would include the following:

- fossils fuels and water would be consumed and labor and materials would be expended during construction and to a much lesser extent, during operation (e.g., O&M vehicle fuel). This would be offset by renewable energy produced through wind rather than consumption of fossil fuel.

- Some damage to, or illegal collection of, paleontological or cultural resources may occur.
- Up to 222 acres of soil and vegetation disturbance would occur, resulting in some soil loss and some stream sedimentation, until surface-disturbed areas are successfully reclaimed. Up to 69 acres of vegetation would be lost for the life-of-project.
- Some additional emissions of fugitive dust, sulfur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, and volatile organic compounds would occur.
- Some wildlife mortality would occur.

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4.0 CONSULTATION AND COORDINATION

Table 4.1 presents a list contacts made to during preparation of this EA.

Table 4.1 Consultation and Coordination

Contact	Affiliation, Location	Date	Purpose of Contact
Federal			
Don Anderson	FWS, Lakewood	March 2005	Information regarding minor depletions
Francisco Escobedo	Forest Service, Pawnee National Grassland	January 2005	Number of power plants in the airshed
Stephanie Jones	FWS, Denver	January 2005	Mortality data for existing wind project west of Peetz
Susan Linner	FWS, Lakewood	November 2004	Provide information on TEP&C species and migratory birds
Sandy Vana-Miller	FWS, Lakewood	October 2004, February 2005 March 2005	On-site visit to discuss wildlife issues; wildlife mitigation meeting; information regarding minor depletions; raptor nest mitigation
Cadastral Survey Office	Bureau of Land Management, Lakewood	March 2005	Plat maps
State			
Kirstie Bay	CDOW, Brush	October 2004, February 2005	On-site visit to discuss wildlife issues; wildlife mitigation meeting; species list; swift fox data
Larry Budde	CDOW, Brush	October 2004	On-site visit to discuss wildlife issues
Larry Crooks	CDOW, Julesburg	October 2004	On-site visit to discuss wildlife issues
Byron Gillham	CDOW, Peetz	October 2004; December 2004	Obtain local information concerning wildlife and water well depths
Michael Meneffee	CNHP, Fort Collins	October 2004	Database search for sensitive species and communities
Rick Moss	CDOW, retired	October 2004	On-site visit to discuss wildlife issues
Marty Stratman	CDOW, Brush	October 2004	On-site visit to discuss wildlife issues
County			
Roger Japp	Logan County Under Sheriff, Sterling	March 2005	Public health and safety issues related to existing wind project west of Peetz
Dustin McCormick	Logan County Planning Department, Sterling	March 2005	Land use planning and reasonably foreseeable development
Chad Wright	Logan County Road and Bridge Department, Sterling	March 2005	Impacts to county roads from the construction of the existing wind project west of Peetz
Other			
Doug Carter	Business Development Director for SCE, Littleton	Various	SCE's Proposed Action
Gary Gillham	Landowner, Peetz	March 2005	General impacts of existing wind project west of Peetz
Mike Logsdon	President of Diamondback Services, Littleton	Various	SCE's Proposed Action
Brent Orr	Attorney for SCE, Wray	Various	SCE's Proposed Action
Rich Schneider	Nebraska Game and Parks Commission, Lincoln Nebraska	January 2005	Wildlife information
Joel Schroeder	Project Manager for SCE, Chicago	Various	SCE's Proposed Action

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APPENDIX A:

PROJECT AREA SOILS AND SELECTED
SOIL CHARACTERISTICS

Appendix A Project Area Soils and Selected Soil Characteristics.[1]

Map Unit No. /Soil Type	Topographic Position	Depth, Drainage, and Permeability	Erosion Hazard	Typical Native Plants	Risk of Concrete Corrosion[2]
Soil Types to be Impacted by Turbine Construction					
4 Altvan-Eckley sandy loams, 3-5% slopes	Gently sloping soils on upland ridges and sideslopes	Deep (>60 inches) and well-drained; moderate permeability	Moderate	Blue grama, buffalograss, western wheatgrass, sedge	Low
5 Altvan-Eckley sandy loams, 5-9% slopes	Moderately sloping soils on upland ridges and side slopes	Deep (>60 inches) and well-drained; moderate permeability	High	Blue grama, buffalograss, western wheatgrass, sedge, sand dropseed, sand reedgrass, little bluestem, switchgrass, sand bluestem, needle-and-thread grass	Low
13 Badlands	Steep slopes	Steep and very steep barren land	Active erosion	Rocky Mountain juniper, eastern red cedar, yellow current, chokecherry, squawbush, wild current, wild plum	na
17 Canyon gravelly loam, 1-25% slopes	Floodplains and alluvial fans	Shallow (11 inches) and well-drained; rapid permeability	Slight to moderate (soil blowing)	Sand bluestem, blue grama, sand reedgrass, sand dropseed, needle-and-thread grass, switchgrass, sand sage	Low
20 Dacono loam	Upland tablelands	Deep (>60 inches) and well-drained; slow permeability	Slight	Blue grama, buffalograss, western wheatgrass, sedge	Low
25 Dix-Eckley complex, 5-25% slopes	Moderately sloping to moderately steep soils on gravelly uplands	Deep (>60 inches) and excessively drained; gravelly to moderately well-drained; moderate to rapid permeability	High	Blue grama, side-oats grama, little bluestem, buffalograss, sedge	Low
43 Iliff loam	Upland tablelands	Moderately deep (34 inches); well-drained; slow permeability	Slight	Blue grama, buffalograss, western wheatgrass, sedge	Low

Appendix A (Continued)

Map Unit No. /Soil Type	Topographic Position	Depth, Drainage, and Permeability	Erosion Hazard	Typical Native Plants	Risk of Concrete Corrosion[2]
91 Platner-Rago-Dacono loams	Gently sloping soils on upland tablelands	Deep (>60 inches) and well-drained; slow permeability	Sight to moderate	Blue grama, buffalograss, western wheatgrass, sedge	Low
92 Rago loam	Concave upland flats, swales, and drainageways	Deep (>60 inches) and well-drained; slow permeability	Slight	Blue grama, buffalograss, western wheatgrass, sedge	Low
96 Rosebud-Escabosa loams, 3-5% slopes	Gently sloping soils on upland ridges and sideslopes	Moderately deep (15 to 22 inches) and well-drained; slow to moderately slow permeability	Moderate	Blue grama, buffalograss, western wheatgrass, sedge	Low
97 Rosebud-Escabosa loams, 5-9% slopes	Moderately sloping soils on hillslopes and convex ridges	Moderately deep (15 to 22 inches) and well-drained; moderately slow to moderate permeability	Moderate	Blue grama, buffalograss, western wheatgrass, sedge	Low
98 Rosebud-Escabosa-Iliff loams, 0-3% slopes	Nearly level to gently sloping soils on upland tablelands	Moderately deep (22 to 34 inches) and well-drained; moderately slow to moderate permeability	Slight	Blue grama, buffalograss, western wheatgrass, sedge	Low
Other Soil Types Occurring in the Project Area					
14 Bankard sand	Floodplains and low terraces	Deep (>60 inches) and somewhat excessively drained; rapid permeability	Slight to moderate	Sand bluestem, blue grama, sand reedgrass, sand dropseed, needle-and-thread grass, switchgrass, sand sage	Low
18 Chappell sandy loam	Floodplains and alluvial fans	Deep (>60 inches) and well drained; rapid permeability	Slight to moderate (soil blowing)	Sand bluestem, sand reedgrass, sand dropseed, little bluestem, blue grama, needle-and-thread grass, switchgrass, sand sage	Low
24 Dix-Altvan complex, 9-25% slopes	Strongly sloping to moderately steep soils on gravelly uplands	Deep (>60 inches); somewhat excessively drained to well-drained; moderate to rapid permeability	Moderate to high	Blue grama, side-oats grama, little bluestem, buffalograss, western wheatgrass, sedge	Low

Appendix A (Continued)

Map Unit No. /Soil Type	Topographic Position	Depth, Drainage, and Permeability	Erosion Hazard	Typical Native Plants	Risk of Concrete Corrosion[2]
61 Manter sandy loam, 0-3% slopes	Upland flats, terraces, and alluvial fans	Deep (>60 inches) and well-drained; moderately rapid permeability	Slight to moderate (soil blowing)	Sand bluestem, sand reedgrass, sand dropseed, little bluestem, blue grama, needle-and-thread grass, switchgrass, sand sage	Low
62 Manter sandy loam, 3-5% slopes	Upland hills and ridges	Deep (>60 inches) and well-drained, moderately rapid permeability	Moderate (soil blowing)	Sand bluestem, sand reedgrass, sand dropseed, little bluestem, blue grama, needle-and-thread grass, switchgrass, sand sagebrush.	Low
86 Peetz gravelly sandy loam, 5-25% slopes	Upland ridges and knobs	Deep (>60 inches) and well-drained; rapid permeability	Moderate (soil blowing)	Side-oats grama, little bluestem, blue grama, buffalograss, and sedge	Low
89 Platner loam, 1-3% slopes	Upland tablelands	Deep (>60 inches) and well-drained; slow permeability	Slight	Blue grama, buffalograss, western wheatgrass, sedge	Low
90 Platner loam, 3-5% slopes	Upland hills and ridges	Deep (>60 inches) and well-drained; slow permeability	Moderate	Blue grama, buffalograss, western wheatgrass, sedge	Low
100 Satanta loam, 1-3% slopes	Terraces and upland flats	Deep (>60 inches) and well- drained; moderate permeability	Slight	Blue grama, buffalograss, western wheatgrass, sedge	Low
101 Satanta loam, 3-5% slopes	Upland ridges and hills	Deep (>60 inches) and well-drained; moderate permeability	Moderate	Blue grama, buffalograss, western wheatgrass, sedge	Low
112 Ustic torriorthents	Strongly sloping to steep soils bordering intermittent drainageways, gullies, and escarpments	Shallow (n.a.)[3] and well-drained; variable	High	Sparsely vegetated; side-oats grama, little bluestem, blue grama, western wheatgrass, needle-and-thread grass	na
118 Wages loam, 0-3% slopes	Nearly level to gently sloping soils on upland flats	Deep (>60 inches) and well-drained; moderate permeability	Slight	Blue grama, buffalograss, western wheatgrass, sedge	Low

Appendix A (Continued)

Map Unit No. /Soil Type	Topographic Position	Depth, Drainage, and Permeability	Erosion Hazard	Typical Native Plants	Risk of Concrete Corrosion[2]
119 Wages loam, 3 - 5% slopes	Upland ridges and hills	Deep (>60 inches) and well-drained; moderate permeability	Moderate	Blue grama, buffalograss, western wheatgrass, sedge	Low
120 Wages loam, 5-9% slopes	Moderately sloping soils on upland sideslopes and ridges	Deep (>60 inches) and well-drained; moderate permeability	Moderate	Blue grama, buffalograss, western wheatgrass, sedge	Low
122 Wages-Manter complex, 3-9% slopes	Gently sloping soils on upland ridges and hills	Deep (>60 inches) and well-drained, moderate to moderately rapid permeability	Moderate	Blue grama, buffalograss, western wheatgrass, sedge, sand dropseed, sand reedgrass, little bluestem, switchgrass, sand bluestem, needle-and-thread grass	Low
130 - Intermittent Water	--	--	--	--	--
132 - Intermittent Water	--	--	--	--	--

[1] Source: Amen et al. (1977).
[2] na = not available.
[3] Depth varies.

APPENDIX B:

WILDLIFE KNOWN TO OCCUR OR LIKELY TO OCCUR
IN LOGAN COUNTY, COLORADO (CDOW UNPUBLISHED DATA)

Logan county

Known or Likely Species Occurrence

Group	Common Name	Scientific Name	Occurence	Abundance
Amphibians	Bullfrog	Rana catesbeiana	Known to occur	Common
Amphibians	Great Plains Toad	Bufo cognatus	Known to occur	Uncommon
Amphibians	Northern Cricket Frog	Acris crepitans	Likely to occur	Unknown
Amphibians	Northern Leopard Frog	Rana pipiens	Known to occur	Unknown
Amphibians	Plains Leopard Frog	Rana blairi	Likely to occur	Unknown
Amphibians	Plains Spadefoot	Spea bombifrons	Known to occur	Common
Amphibians	Tiger Salamander	Ambystoma tigrinum	Known to occur	Common
Amphibians	Western Chorus Frog	Pseudacris triseriata	Known to occur	Common
Amphibians	Woodhouse's Toad	Bufo woodhousii	Known to occur	Common
Birds	American Avocet	Recurvirostra americana	Known to occur	Uncommon
Birds	American Bittern	Botaurus lentiginosus	Known to occur	Unknown
Birds	American Coot	Fulica americana	Known to occur	Uncommon
Birds	American Crow	Corvus brachyrhynchos	Known to occur	Fairly Common
Birds	American Golden Plover	Pluvialis dominica	Likely to occur	No Occurrence
Birds	American Goldfinch	Carduelis tristis	Known to occur	Uncommon
Birds	American Kestrel	Falco sparverius	Known to occur	Fairly Common
Birds	American Peregrine Falcon	Falco peregrinus anatum	Known to occur	Unknown

Birds	American Pipit	Anthus rubescens	Known to occur	Unknown
Birds	American Redstart	Setophaga ruticilla	Known to occur	Unknown
Birds	American Robin	Turdus migratorius	Known to occur	Common
Birds	American Tree Sparrow	Spizella arborea	Known to occur	Unknown
Birds	American White Pelican	Pelecanus erythrorhynchos	Known to occur	Unknown
Birds	American Wigeon	Anas americana	Known to occur	Rare
Birds	Baird's Sandpiper	Calidris bairdii	Known to occur	Unknown
Birds	Bald Eagle	Haliaeetus leucocephalus	Known to occur	Unknown
Birds	Baltimore Oriole	Icterus galbula	Known to occur	Fairly Common
Birds	Bank Swallow	Riparia riparia	Known to occur	Common
Birds	Barn Owl	Tyto alba	Known to occur	Uncommon
Birds	Barn Swallow	Hirundo rustica	Known to occur	Abundant
Birds	Bell's Vireo	Vireo bellii	Known to occur	Uncommon
Birds	Belted Kingfisher	Ceryle alcyon	Known to occur	Uncommon
Birds	Black Tern	Chlidonias niger	Known to occur	Rare
Birds	Black-bellied Plover	Pluvialis squatarola	Known to occur	Unknown
Birds	Black-billed Cuckoo	Coccyzus erythropthalmus	Known to occur	Rare
Birds	Black-billed Magpie	Pica pica	Known to occur	Common
Birds	Black-capped Chickadee	Poecile atricapillus	Known to occur	Fairly Common

Birds	Black-crowned Night-Heron	Nycticorax nycticorax	Known to occur	Uncommon
Birds	Black-headed Grosbeak	Pheucticus melanocephalus	Known to occur	Uncommon
Birds	Black-necked Stilt	Himantopus mexicanus	Known to occur	Unknown
Birds	Blackpoll Warbler	Dendroica striata	Likely to occur	No Occurrence
Birds	Black-throated Gray Warbler	Dendroica nigrescens	Known to occur	Unknown
Birds	Blue Grosbeak	Guiraca caerulea	Known to occur	Uncommon
Birds	Blue Jay	Cyanocitta cristata	Known to occur	Fairly Common
Birds	Blue-gray Gnatcatcher	Polioptila caerulea	Known to occur	Unknown
Birds	Blue-winged Teal	Anas discors	Known to occur	Fairly Common
Birds	Bobolink	Dolichonyx oryzivorus	Known to occur	Unknown
Birds	Bonaparte's Gull	Larus philadelphia	Known to occur	Unknown
Birds	Brewer's Blackbird	Euphagus cyanocephalus	Known to occur	Uncommon
Birds	Brewer's Sparrow	Spizella breweri	Known to occur	Uncommon
Birds	Broad-tailed Hummingbird	Selasphorus platycercus	Known to occur	Unknown
Birds	Brown Creeper	Certhia americana	Known to occur	Unknown
Birds	Brown Thrasher	Toxostoma rufum	Known to occur	Fairly Common
Birds	Brown-headed Cowbird	Molothrus ater	Known to occur	Common
Birds	Bufflehead	Bucephala albeola	Known to occur	Unknown
Birds	Bullock's Oriole	Icterus bullockii	Known to occur	Fairly Common

Birds	California Gull	Larus californicus	Known to occur	Unknown
Birds	Canada Goose	Branta canadensis	Known to occur	Common
Birds	Canvasback	Aythya valisineria	Known to occur	Unknown
Birds	Cassin's Kingbird	Tyrannus vociferans	Known to occur	Unknown
Birds	Cassin's Sparrow	Aimophila cassinii	Known to occur	Fairly Common
Birds	Cattle Egret	Bubulcus ibis	Known to occur	Unknown
Birds	Cedar Waxwing	Bombycilla cedrorum	Known to occur	Unknown
Birds	Chestnut-collared Longspur	Calcarius ornatus	Known to occur	Unknown
Birds	Chimney Swift	Chaetura pelagica	Known to occur	Fairly Common
Birds	Chipping Sparrow	Spizella passerina	Known to occur	Casual/Accidental
Birds	Cinnamon Teal	Anas cyanoptera	Known to occur	Uncommon
Birds	Clark's Grebe	Aechmophorus clarkii	Known to occur	Unknown
Birds	Clay-colored Sparrow	Spizella pallida	Known to occur	Unknown
Birds	Cliff Swallow	Petrochelidon pyrrhonota	Known to occur	Abundant
Birds	Common Goldeneye	Bucephala clangula	Known to occur	Unknown
Birds	Common Grackle	Quiscalus quiscula	Known to occur	Abundant
Birds	Common Loon	Gavia immer	Known to occur	Unknown
Birds	Common Merganser	Mergus merganser	Known to occur	Unknown
Birds	Common Nighthawk	Chordeiles minor	Known to occur	Fairly Common

Birds	Common Poorwill	Phalaenoptilus nuttallii	Known to occur	Unknown
Birds	Common Raven	Corvus corax	Known to occur	Unknown
Birds	Common Redpoll	Carduelis flammea	Known to occur	Unknown
Birds	Common Snipe	Gallinago gallinago	Known to occur	Rare
Birds	Common Tern	Sterna hirundo	Known to occur	Unknown
Birds	Common Yellowthroat	Geothlypis trichas	Known to occur	Common
Birds	Cooper's Hawk	Accipiter cooperii	Known to occur	Unknown
Birds	Cordilleran Flycatcher	Empidonax occidentalis	Known to occur	Unknown
Birds	Dark-eyed Junco	Junco hyemalis	Known to occur	Unknown
Birds	Dickcissel	Spiza americana	Known to occur	Uncommon
Birds	Double-crested Cormorant	Phalacrocorax auritus	Known to occur	Uncommon
Birds	Downy Woodpecker	Picoides pubescens	Known to occur	Uncommon
Birds	Eared Grebe	Podiceps nigricollis	Known to occur	Unknown
Birds	Eastern Bluebird	Sialia sialis	Known to occur	Uncommon
Birds	Eastern Kingbird	Tyrannus tyrannus	Known to occur	Fairly Common
Birds	Eastern Meadowlark	Sturnella magna	Known to occur	Very Rare
Birds	Eastern Phoebe	Sayornis phoebe	Known to occur	Casual/Accidental
Birds	Eastern Screech-Owl	Otus asio	Known to occur	Uncommon
Birds	European Starling	Sturnus vulgaris	Known to occur	Abundant

Birds	Evening Grosbeak	Coccothraustes vespertinus	Known to occur	Unknown
Birds	Ferruginous Hawk	Buteo regalis	Known to occur	Uncommon
Birds	Field Sparrow	Spizella pusilla	Known to occur	Uncommon
Birds	Forster's Tern	Sterna forsteri	Known to occur	Rare
Birds	Franklin's Gull	Larus pipixcan	Known to occur	Unknown
Birds	Gadwall	Anas strepera	Known to occur	Rare
Birds	Glaucous Gull	Larus hyperboreus	Known to occur	Unknown
Birds	Golden Eagle	Aquila chrysaetos	Known to occur	Rare
Birds	Golden-crowned Kinglet	Regulus satrapa	Known to occur	Unknown
Birds	Grasshopper Sparrow	Ammodramus savannarum	Known to occur	Fairly Common
Birds	Gray Catbird	Dumetella carolinensis	Known to occur	Unknown
Birds	Great Blue Heron	Ardea herodias	Known to occur	Common
Birds	Great Crested Flycatcher	Myiarchus crinitus	Known to occur	Uncommon
Birds	Great Egret	Ardea alba	Known to occur	Unknown
Birds	Great Horned Owl	Bubo virginianus	Known to occur	Fairly Common
Birds	Greater Prairie-chicken	Tympanuchus cupido	Known to occur	Rare
Birds	Greater Roadrunner	Geococcyx californianus	Known to occur	Unknown
Birds	Greater Sandhill Crane	Grus canadensis tabida	Known to occur	Unknown
Birds	Greater White-fronted Goose	Anser albifrons	Known to occur	Unknown

Birds	Greater Yellowlegs	Tringa melanoleuca	Known to occur	Unknown
Birds	Great-tailed Grackle	Quiscalus mexicanus	Known to occur	Unknown
Birds	Green Heron	Butorides virescens	Known to occur	Casual/Accidental
Birds	Green-tailed Towhee	Pipilo chlorurus	Known to occur	Unknown
Birds	Green-winged Teal	Anas crecca	Known to occur	Rare
Birds	Hairy Woodpecker	Picoides villosus	Known to occur	Rare
Birds	Harris' Sparrow	Zonotrichia querula	Likely to occur	No Occurrence
Birds	Hermit Thrush	Catharus guttatus	Known to occur	Unknown
Birds	Herring Gull	Larus argentatus	Known to occur	Unknown
Birds	Hooded Merganser	Lophodytes cucullatus	Known to occur	Unknown
Birds	Horned Grebe	Podiceps auritus	Likely to occur	No Occurrence
Birds	Horned Lark	Eremophila alpestris	Known to occur	Abundant
Birds	House Finch	Carpodacus mexicanus	Known to occur	Common
Birds	House Sparrow	Passer domesticus	Known to occur	Abundant
Birds	House Wren	Troglodytes aedon	Known to occur	Common
Birds	Indigo Bunting	Passerina cyanea	Known to occur	Rare
Birds	Killdeer	Charadrius vociferus	Known to occur	Abundant
Birds	Lapland Longspur	Calcarius lapponicus	Known to occur	Unknown
Birds	Lark Bunting	Calamospiza melanocorys	Known to occur	Abundant

Birds	Lark Sparrow	Chondestes grammacus	Known to occur	Fairly Common
Birds	Lazuli Bunting	Passerina amoena	Known to occur	Uncommon
Birds	Least Bittern	Ixobrychus exilis	Known to occur	Unknown
Birds	Least Sandpiper	Calidris minutilla	Known to occur	Unknown
Birds	Least Tern	Sterna antillarum	Known to occur	Unknown
Birds	Lesser Scaup	Aythya affinis	Known to occur	Unknown
Birds	Lesser Yellowlegs	Tringa flavipes	Known to occur	Unknown
Birds	Lewis' Woodpecker	Melanerpes lewis	Known to occur	Unknown
Birds	Lincoln's Sparrow	Melospiza lincolnii	Known to occur	Unknown
Birds	Little Blue Heron	Egretta caerulea	Known to occur	Unknown
Birds	Loggerhead Shrike	Lanius ludovicianus	Known to occur	Uncommon
Birds	Long-billed Curlew	Numenius americanus	Known to occur	Rare
Birds	Long-billed Dowitcher	Limnodromus scolopaceus	Known to occur	Unknown
Birds	Long-eared Owl	Asio otus	Known to occur	Rare
Birds	MacGillivray's Warbler	Oporornis tolmiei	Known to occur	Unknown
Birds	Mallard	Anas platyrhynchos	Known to occur	Common
Birds	Marbled Godwit	Limosa fedoa	Known to occur	Unknown
Birds	Marsh Wren	Cistothorus palustris	Known to occur	Common
Birds	McCown's Longspur	Calcarius mccownii	Known to occur	Uncommon

Birds	Mountain Bluebird	Sialia currucoides	Known to occur	Unknown
Birds	Mountain Plover	Charadrius montanus	Known to occur	Rare
Birds	Mourning Dove	Zenaida macroura	Known to occur	Abundant
Birds	Nashville Warbler	Vermivora ruficapilla	Likely to occur	No Occurrence
Birds	Northern Bobwhite	Colinus virginianus	Known to occur	Fairly Common
Birds	Northern Cardinal	Cardinalis cardinalis	Known to occur	Unknown
Birds	Northern Flicker	Colaptes auratus	Known to occur	Fairly Common
Birds	Northern Goshawk	Accipiter gentilis	Known to occur	Unknown
Birds	Northern Harrier	Circus cyaneus	Known to occur	Uncommon
Birds	Northern Mockingbird	Mimus polyglottos	Known to occur	Uncommon
Birds	Northern Pintail	Anas acuta	Known to occur	Fairly Common
Birds	Northern Rough-winged Swallow	Stelgidopteryx serripennis	Known to occur	Fairly Common
Birds	Northern Saw-whet Owl	Aegolius acadicus	Known to occur	Unknown
Birds	Northern Shoveler	Anas clypeata	Known to occur	Uncommon
Birds	Northern Waterthrush	Seiurus noveboracensis	Known to occur	Unknown
Birds	Oldsquaw	Clangula hyemalis	Known to occur	Unknown
Birds	Olive-sided Flycatcher	Contopus cooperi	Known to occur	Unknown
Birds	Orange-crowned Warbler	Vermivora celata	Known to occur	Unknown
Birds	Orchard Oriole	Icterus spurius	Known to occur	Fairly Common

Birds	Osprey	Pandion haliaetus	Known to occur	Unknown
Birds	Ovenbird	Seiurus aurocapillus	Known to occur	Unknown
Birds	Pacific Loon	Gavia pacifica	Likely to occur	No Occurrence
Birds	Palm Warbler	Dendroica palmarum	Known to occur	Unknown
Birds	Pectoral Sandpiper	Calidris melanotos	Known to occur	Unknown
Birds	Peregrine Falcon	Falco peregrinus	Known to occur	Unknown
Birds	Pied-billed Grebe	Podilymbus podiceps	Known to occur	Unknown
Birds	Pine Grosbeak	Pinicola enucleator	Known to occur	Unknown
Birds	Pine Siskin	Carduelis pinus	Known to occur	Unknown
Birds	Piping Plover	Charadrius melodus	Known to occur	Unknown
Birds	Plains Sharp-tailed Grouse	Tympanuchus phasianellus jamesii	Known to occur	Unknown
Birds	Prairie Falcon	Falco mexicanus	Known to occur	Uncommon
Birds	Pygmy Nuthatch	Sitta pygmaea	Known to occur	Unknown
Birds	Red Crossbill	Loxia curvirostra	Known to occur	Unknown
Birds	Red Knot	Calidris canutus	Known to occur	Unknown
Birds	Red-bellied Woodpecker	Melanerpes carolinus	Known to occur	Uncommon
Birds	Red-breasted Merganser	Mergus serrator	Known to occur	Unknown
Birds	Red-breasted Nuthatch	Sitta canadensis	Known to occur	Unknown
Birds	Red-eyed Vireo	Vireo olivaceus	Known to occur	Unknown

Birds	Redhead	Aythya americana	Known to occur	Rare
Birds	Red-headed Woodpecker	Melanerpes erythrocephalus	Known to occur	Uncommon
Birds	Red-necked Phalarope	Phalaropus lobatus	Known to occur	Unknown
Birds	Red-tailed Hawk	Buteo jamaicensis	Known to occur	Uncommon
Birds	Red-winged Blackbird	Agelaius phoeniceus	Known to occur	Abundant
Birds	Ring-billed Gull	Larus delawarensis	Known to occur	Unknown
Birds	Ring-necked Duck	Aythya collaris	Known to occur	Unknown
Birds	Ring-necked Pheasant	Phasianus colchicus	Known to occur	Fairly Common
Birds	Rock Dove	Columba livia	Known to occur	Abundant
Birds	Rock Wren	Salpinctes obsoletus	Known to occur	Uncommon
Birds	Rose-breasted Grosbeak	Pheucticus ludovicianus	Known to occur	Unknown
Birds	Ross' Goose	Chen rossii	Known to occur	Unknown
Birds	Rough-legged Hawk	Buteo lagopus	Known to occur	Unknown
Birds	Ruby-crowned Kinglet	Regulus calendula	Known to occur	Unknown
Birds	Ruddy Duck	Oxyura jamaicensis	Known to occur	Unknown
Birds	Sabine's Gull	Xema sabini	Known to occur	Unknown
Birds	Sage Thrasher	Oreoscoptes montanus	Known to occur	Unknown
Birds	Sandhill Crane	Grus canadensis	Known to occur	Unknown
Birds	Savannah Sparrow	Passerculus sandwichensis	Known to occur	Rare

Birds	Say's Phoebe	Sayornis saya	Known to occur	Uncommon
Birds	Scissor-tailed Flycatcher	Tyrannus forficatus	Known to occur	Unknown
Birds	Semipalmated Plover	Charadrius semipalmatus	Known to occur	Unknown
Birds	Semipalmated Sandpiper	Calidris pusilla	Known to occur	Unknown
Birds	Sharp-shinned Hawk	Accipiter striatus	Known to occur	Unknown
Birds	Sharp-tailed Grouse	Tympanuchus phasianellus	Known to occur	Unknown
Birds	Short-eared Owl	Asio flammeus	Known to occur	Rare
Birds	Snow Goose	Chen caerulescens	Known to occur	Unknown
Birds	Snowy Egret	Egretta thula	Known to occur	Unknown
Birds	Snowy Owl	Nyctea scandiaca	Known to occur	Unknown
Birds	Snowy Plover	Charadrius alexandrinus	Known to occur	Unknown
Birds	Solitary Sandpiper	Tringa solitaria	Known to occur	Unknown
Birds	Song Sparrow	Melospiza melodia	Known to occur	Unknown
Birds	Sora	Porzana carolina	Known to occur	Rare
Birds	Southwestern Willow Flycatcher	Empidonax traillii extimus	Known to occur	Unknown
Birds	Spotted Sandpiper	Actitis macularia	Known to occur	Uncommon
Birds	Spotted Towhee	Pipilo maculatus	Known to occur	Unknown
Birds	Steller's Jay	Cyanocitta stelleri	Known to occur	Unknown
Birds	Stilt Sandpiper	Calidris himantopus	Known to occur	Unknown

Birds	Summer Tanager	Piranga rubra	Likely to occur	No Occurrence
Birds	Surf Scoter	Melanitta perspicillata	Known to occur	Unknown
Birds	Swainson's Hawk	Buteo swainsoni	Known to occur	Fairly Common
Birds	Swainson's Thrush	Catharus ustulatus	Known to occur	Unknown
Birds	Swamp Sparrow	Melospiza georgiana	Known to occur	Unknown
Birds	Townsend's Solitaire	Myadestes townsendi	Known to occur	Unknown
Birds	Tree Swallow	Tachycineta bicolor	Known to occur	Uncommon
Birds	Tundra Swan	Cygnus columbianus	Known to occur	Unknown
Birds	Turkey Vulture	Cathartes aura	Known to occur	Rare
Birds	Upland Sandpiper	Bartramia longicauda	Known to occur	Uncommon
Birds	Varied Thrush	Ixoreus naevius	Likely to occur	No Occurrence
Birds	Veery	Catharus fuscescens	Known to occur	Unknown
Birds	Vesper Sparrow	Pooecetes gramineus	Known to occur	Unknown
Birds	Violet-green Swallow	Tachycineta thalassina	Known to occur	Unknown
Birds	Virginia Rail	Rallus limicola	Known to occur	Uncommon
Birds	Virginia's Warbler	Vermivora virginiae	Known to occur	Unknown
Birds	Warbling Vireo	Vireo gilvus	Known to occur	Uncommon
Birds	Western Burrowing Owl	Athene cunicularia	Known to occur	Uncommon
Birds	Western Grebe	Aechmophorus occidentalis	Known to occur	Unknown

Birds	Western Kingbird	Tyrannus verticalis	Known to occur	Common
Birds	Western Meadowlark	Sturnella neglecta	Known to occur	Abundant
Birds	Western Sandpiper	Calidris mauri	Known to occur	Unknown
Birds	Western Snowy Plover	Charadrius alexandrinus nivosus	Known to occur	Unknown
Birds	Western Tanager	Piranga ludoviciana	Known to occur	Unknown
Birds	Western Wood-Pewee	Contopus sordidulus	Known to occur	Uncommon
Birds	Whimbrel	Numenius phaeopus	Known to occur	Unknown
Birds	White-breasted Nuthatch	Sitta carolinensis	Known to occur	Rare
Birds	White-crowned Sparrow	Zonotrichia leucophrys	Known to occur	Unknown
Birds	White-faced Ibis	Plegadis chihi	Known to occur	Unknown
Birds	White-rumped Sandpiper	Calidris fuscicollis	Known to occur	Unknown
Birds	White-throated Sparrow	Zonotrichia albicollis	Known to occur	Unknown
Birds	White-throated Swift	Aeronautes saxatalis	Known to occur	Unknown
Birds	White-winged Crossbill	Loxia leucoptera	Known to occur	Unknown
Birds	White-winged Scoter	Melanitta fusca	Known to occur	Unknown
Birds	Whooping Crane	Grus americana	Likely to occur	No Occurrence
Birds	Wild Turkey	Meleagris gallopavo	Known to occur	Uncommon
Birds	Willet	Catoptrophorus semipalmatus	Known to occur	Unknown
Birds	Willow Flycatcher	Empidonax traillii	Known to occur	Unknown

Birds	Wilson's Phalarope	Phalaropus tricolor	Known to occur	Rare
Birds	Wilson's Warbler	Wilsonia pusilla	Known to occur	Unknown
Birds	Winter Wren	Troglodytes troglodytes	Known to occur	Unknown
Birds	Wood Duck	Aix sponsa	Known to occur	Uncommon
Birds	Wood Thrush	Hylocichla mustelina	Likely to occur	No Occurrence
Birds	Yellow Warbler	Dendroica petechia	Known to occur	Fairly Common
Birds	Yellow-billed Cuckoo	Coccyzus americanus	Known to occur	Uncommon
Birds	Yellow-breasted Chat	Icteria virens	Known to occur	Uncommon
Birds	Yellow-crowned Night-Heron	Nyctanassa violacea	Known to occur	Unknown
Birds	Yellow-headed Blackbird	Xanthocephalus xanthocephalus	Known to occur	Abundant
Birds	Yellow-rumped Warbler	Dendroica coronata	Known to occur	Unknown
Mammals	American Badger	Taxidea taxus	Known to occur	Uncommon
Mammals	American Beaver	Castor canadensis	Known to occur	Fairly Common
Mammals	American Elk	Cervus elaphus	Known to occur	Rare
Mammals	Big Brown Bat	Eptesicus fuscus	Known to occur	Abundant
Mammals	Black-tailed Jackrabbit	Lepus californicus	Known to occur	Fairly Common
Mammals	Black-tailed Prairie Dog	Cynomys ludovicianus	Known to occur	Fairly Common
Mammals	Bobcat	Lynx rufus	Known to occur	Very Rare
Mammals	Bushy-tailed Woodrat	Neotoma cinerea	Known to occur	Fairly Common

Mammals	Common Muskrat	Ondatra zibethicus	Known to occur	Common
Mammals	Common Porcupine	Erethizon dorsatum	Known to occur	Uncommon
Mammals	Coyote	Canis latrans	Known to occur	Abundant
Mammals	Deer Mouse	Peromyscus maniculatus	Known to occur	Abundant
Mammals	Desert Cottontail	Sylvilagus audubonii	Known to occur	Common
Mammals	Eastern Cottontail	Sylvilagus floridanus	Known to occur	Common
Mammals	Eastern Mole	Scalopus aquaticus	Known to occur	Uncommon
Mammals	Eastern Spotted Skunk	Spilogale putorius	Likely to occur	Unknown
Mammals	Fox Squirrel	Sciurus niger	Known to occur	Common
Mammals	Hispid Pocket Mouse	Chaetodipus hispidus	Known to occur	Fairly Common
Mammals	Hoary Bat	Lasiurus cinereus	Likely to occur	Unknown
Mammals	House Mouse	Mus musculus	Known to occur	Abundant
Mammals	Least Shrew	Cryptotis parva	Known to occur	Uncommon
Mammals	Little Brown Myotis	Myotis lucifugus	Likely to occur	Unknown
Mammals	Long-tailed Weasel	Mustela frenata	Known to occur	Rare
Mammals	Masked Shrew	Sorex cinereus	Known to occur	Fairly Common
Mammals	Meadow Vole	Microtus pennsylvanicus	Known to occur	Common
Mammals	Mink	Mustela vison	Known to occur	Rare
Mammals	Mountain Lion	Felis concolor	Likely to occur	Unknown

Mammals	Mule Deer	Odocoileus hemionus	Known to occur	Common
Mammals	Northern Grasshopper Mouse	Onychomys leucogaster	Known to occur	Fairly Common
Mammals	Northern Pocket Gopher	Thomomys talpoides	Known to occur	Common
Mammals	Northern River Otter	Lutra canadensis	Known to occur	Very Rare
Mammals	Ord's Kangaroo Rat	Dipodomys ordii	Known to occur	Common
Mammals	Plains Harvest Mouse	Reithrodontomys montanus	Known to occur	Uncommon
Mammals	Plains Pocket Gopher	Geomys bursarius	Known to occur	Fairly Common
Mammals	Plains Pocket Mouse	Perognathus flavescens	Known to occur	Fairly Common
Mammals	Prairie Vole	Microtus ochrogaster	Known to occur	Common
Mammals	Pronghorn	Antilocapra americana	Known to occur	Common
Mammals	Raccoon	Procyon lotor	Known to occur	Common
Mammals	Red Bat	Lasiurus borealis	Likely to occur	Unknown
Mammals	Red Fox	Vulpes vulpes	Known to occur	Common
Mammals	Silky Pocket Mouse	Perognathus flavus	Likely to occur	Unknown
Mammals	Silver-haired Bat	Lasionycteris noctivagans	Likely to occur	Unknown
Mammals	Spotted Ground Squirrel	Spermophilus spilosoma	Known to occur	Uncommon
Mammals	Striped Skunk	Mephitis mephitis	Known to occur	Abundant
Mammals	Swift Fox	Vulpes velox	Known to occur	Rare
Mammals	Thirteen-lined	Spermophilus	Known to	Common

	Ground Squirrel	tridecemlineatus	occur	
Mammals	Virginia Opossum	Didelphis virginiana	Known to occur	Uncommon
Mammals	Western Harvest Mouse	Reithrodontomys megalotis	Likely to occur	Unknown
Mammals	Western Small-footed Myotis	Myotis ciliolabrum	Known to occur	Uncommon
Mammals	White-tailed Deer	Odocoileus virginianus	Known to occur	Common
Mammals	White-tailed Jackrabbit	Lepus townsendii	Known to occur	Fairly Common
Reptiles	Coachwhip	Masticophis flagellum	Likely to occur	Unknown
Reptiles	Common Garter Snake	Thamnophis sirtalis	Known to occur	Uncommon
Reptiles	Fence Lizard	Sceloporus undulatus	Known to occur	Unknown
Reptiles	Glossy Snake	Arizona elegans	Known to occur	Rare
Reptiles	Gopher Snake	Pituophis catenifer	Known to occur	Sparsely Common
Reptiles	Great Plains Skink	Eumeces obsoletus	Likely to occur	Unknown
Reptiles	Lesser Earless Lizard	Holbrookia maculata	Known to occur	Common
Reptiles	Many-lined Skink	Eumeces multivirgatus	Known to occur	Unknown
Reptiles	Midget Faded Rattlesnake	Crotalus viridis concolor	Known to occur	Uncommon
Reptiles	Milk Snake	Lampropeltis triangulum	Known to occur	Rare
Reptiles	Northern Water Snake	Nerodia sipedon	Known to occur	Uncommon
Reptiles	Ornate Box Turtle	Terrapene ornata	Known to occur	Fairly Common
Reptiles	Painted Turtle	Chrysemys picta	Known to occur	Fairly Common
Reptiles	Plains Black-	Tantilla nigriceps	Likely to	Unknown

	headed Snake		occur	
Reptiles	Plains Garter Snake	Thamnophis radix	Known to occur	Fairly Common
Reptiles	Racer	Coluber constrictor	Known to occur	Sparsely Common
Reptiles	Short-horned Lizard	Phrynosoma hernandesi	Known to occur	Unknown
Reptiles	Six-lined Racerunner	Cnemidophorus sexlineatus	Known to occur	Common
Reptiles	Snapping Turtle	Chelydra serpentina	Known to occur	Common
Reptiles	Spiny Softshell	Apalone spinifera	Known to occur	Common
Reptiles	Variable Skink	Eumeces gaigeae	Known to occur	Unknown
Reptiles	Western Hognose Snake	Heterodon nasicus	Known to occur	Uncommon
Reptiles	Western Rattlesnake	Crotalus viridis	Known to occur	Uncommon
Reptiles	Yellow Mud Turtle	Kinosternon flavescens	Likely to occur	Unknown

APPENDIX C:

LETTER FROM SUSAN LINNER, U.S. FISH AND WILDLIFE SERVICE, LAKEWOOD, COLORADO, TO KARYN COPPINGER, TRC MARIAH ASSOCIATES INC., LARAMIE, WYOMING, DATED NOVEMBER 22, 2004

Rec. 11-24-04
KDC
File #

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: Wind Energy/WAPA-Invenergy Wind
Mail Stop 65412

NOV 22 2004

Ms. Karyn Coppinger
TRC Solutions
605 Skyline Drive
Laramie, Wyoming 82070-8909

Dear Ms. Coppinger:

The U.S. Fish and Wildlife Service (Service) received your letter dated October 28, 2004, regarding the **proposed Peetz Table Wind Power Project in Logan County, Colorado**. These comments have been prepared under the provisions of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.), the Bald and Golden Eagle Protection Act of 1940 (BGEPA), as amended (16 U.S.C. 668 et. seq.), the Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. 703 et. seq.), and the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4327).

On May 13, 2003, the Service issued *Interim Guidance on Avoiding and Minimizing Impacts to Wildlife from Wind Turbines* (Guidance), which can be found at the following link: http://www.fws.gov/r9dhcbfa/wind.pdf. Similar to the Service's voluntary guidance addressing the siting, construction, operation, and decommissioning of communication towers and the voluntary guidance developed in cooperation with the electric utility industry to minimize bird strikes and electrocutions (APLIC 1994, APLIC 1996), the Guidance is intended to assist the wind energy industry in avoiding or minimizing impacts to wildlife and their habitats. This is accomplished through: (1) proper evaluation of potential Wind Resource Areas (WRAs), (2) proper location and design of turbines and associated structures within WRAs selected for development, and (3) pre- and post-construction research and monitoring to identify and/or assess impacts to wildlife. The Guidance is based on current science and will be updated as new information becomes available; it is voluntary and interim in nature. The Guidance will be evaluated over a 2-year period and then modified as necessary based on field performance, comments from the public, and on the latest scientific and technical discoveries developed in coordination with industry, states, academic researchers, and other Federal agencies. After the 2-year period, the Service plans to develop a complete operations manual for evaluation, site selection, design, construction, operation, and monitoring of wind energy facilities in both terrestrial and aquatic environments.

Data on wildlife use and mortality collected at one wind energy facility are not necessarily applicable to others; each site poses its own set of possibilities for negative effects on wildlife. In addition, the wind industry is rapidly expanding into habitats and regions that have not been well studied. The Service therefore suggests a precautionary approach to site selection and development, and will employ this approach in making recommendations and assessing impacts of wind energy developments. We encourage the wind energy industry to follow the Guidance and, in cooperation with the Service, to conduct scientific research to provide additional information on the impacts of wind energy development on wildlife. We further encourage the industry to look for opportunities to promote bird and other wildlife conservation when planning wind energy facilities (e.g., voluntary habitat acquisition or conservation easements).

The Service is guided by the Fish and Wildlife Service Mitigation Policy (Federal Register 46 (15), January 1981) in evaluating modifications to or loss of habitat caused by development. This policy follows the sequence of steps recommended in the Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of NEPA in seeking to avoid, minimize, or compensate for negative impacts. Mitigation can involve (1) avoiding the impact of an activity by taking no action; (2) minimizing impacts by limiting the degree of activity; (3) rectifying an impact by repairing, rehabilitating, or restoring an affected environment; (4) reducing or eliminating an impact by conducting activities that preserve and maintain the resources; or (5) compensating for an impact by replacing or providing substitute resources or environments.

Any mitigation recommended by the Service for wind energy development would be voluntary on the part of the developer unless made a condition of a Federal license or permit. Mitigation does not apply to "take" of species under the MBTA, BGEPA, or ESA. The goal of the Service under these laws is the elimination of loss of migratory birds and endangered and threatened species due to wind energy development. The Service will actively expand partnerships with regional, national, and international organizations, States, tribes, industry, and environmental groups to meet this goal.

Projects with Federal involvement may require additional analysis under NEPA, ESA, or the National Wildlife Refuge System Administration Act. This includes projects on federally owned lands (e.g., National Wildlife Refuges, National Forests), lands where a Federal permit is required for development (e.g., BLM-administered lands and jurisdictional wetlands), or lands where Federal funds were used for purchase or improvement (some State Wildlife Management Areas).

The Guidance contains a site evaluation process, called the Potential Impact Index (PII), with checklists for pre-development evaluations of potential terrestrial wind energy development sites. This site evaluation protocol was developed by a team of Federal, State, university, and wind energy industry biologists to rank potential terrestrial wind energy development sites by their potential impacts on wildlife. The PII represents a "first cut" analysis of the suitability of a site proposed for development. It does so by estimating use of the site by selected wildlife species as an indicator of potential impact. Emphasis of the PII is on initial site evaluation and is intended to provide more objectivity than simple reconnaissance surveys. There are two steps to follow:

1. Identify and evaluate reference sites, preferably within the general geographic area of the proposed facility. Reference sites are high-quality wildlife areas where wind development would result in the maximum negative impact on wildlife (i.e., sites selected to have the highest possible rank using the protocol). Reference sites are used to determine the comparative risks of developing other potential sites.

2. Evaluate potential development sites to determine risk to wildlife and rank sites against each other using the highest-ranking reference site as a standard. Although high-ranking sites are generally less desirable for wind energy development, a high rank does not necessarily preclude development of a site, nor does a low rank automatically eliminate the need to conduct predevelopment assessments of wildlife resources or post-development assessments of impacts.

Use of this process allows comparison of one site with another with respect to the impacts that would occur to wildlife if the area were developed. The evaluation area for a potential development site should include the "footprint" encompassing all of the turbines and associated structures including transmission lines planned for that proposed facility, and the adjacent wildlife habitats which may be affected by the proximity of the structures. Transmission lines extending outside the footprint may be excluded. All potential development sites within a geographic area should be evaluated before a site is selected for development.

Pre-development evaluations should be conducted by a team that includes Federal and/or State agency wildlife professionals with no vested interest (e.g., monetary or personal business gain) in the sites selected. Teams may also include academic and industry wildlife professionals as available. Any site evaluations conducted by teams that do not include Federal and/or State agency wildlife professionals will not be considered valid evaluations by the Service. The pre-development evaluation may also identify additional studies needed prior to and after development. Post-construction monitoring to identify any wildlife impacts is recommended at all developed sites. Pre- and post-development studies and monitoring may be conducted by any qualified wildlife biologist without regard to his/her affiliation or interest in the site.

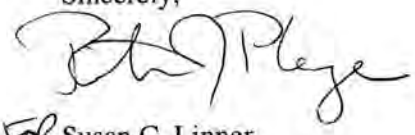
Please also be aware of the potential application of the MBTA and the BGEPA to wind projects involving transmission lines. Protective measures to help reduce possible impacts to migratory birds and other raptors should be installed. 7 CFR § 1724.52 allows for deviations from construction standards for raptor protection, provided that structures are designed and constructed in accordance with *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996* published by the Edison Electric Institute/Raptor Research Foundation. The regulation requires that such structures be in accordance with the National Electrical Safety Code and applicable State and local regulations.

For your convenience, we have enclosed a list of Colorado's threatened and endangered species, as well as the counties in which they are known to occur. We cannot provide site-specific details.

If questions regarding site-specific presence of an endangered species, the extent of its habitat, or the effects of a particular action need to be resolved, the Service recommends that a knowledgeable consultant be contacted to conduct habitat and population assessments or to provide recommendations regarding options under the ESA. Due to staffing constraints, the Colorado Field Office cannot provide you with these services.

If the Service can be of further assistance, please contact Sandy Vana-Miller of my staff at (303) 275-2370.

Sincerely,



For Susan C. Linner
Colorado Field Supervisor

Enclosure: Species List

cc: FWSR6, B. Dach
FWSR6/GJ, E. Mayo
FWSR6/LK, S. Vana-Miller

U. S. Fish and Wildlife Service
Ecological Services
Colorado Field Office

(Effective August 16, 2004)

FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO

COUNTIES	ADAMS	ALAMOSA	ARAPAHOE	ARCHULETA	BACA	BENT	BOULDER	BROOMFIELD	CHAFFEE	CHEYENNE	CLEAR CREEK	CONEJOS	COSTILLA	CROWLEY	CUSTER	DELTA	DENVER
Bald eagle, *Haliaeetus leucocephalus*, Listed Threatened	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, *Centrocercus minimus*, Candidate for Listing		✓		✓					✓			✓	✓			✓	
Least tern (interior population), *Sterna antillarum*, Listed Endangered	▲		▲			✓	▲	▲			▲			✓			▲
Lesser prairie chicken, *Tympanuchus pallidicinctus*, Candidate for Listing					✓	✓				✓				✓			
Mexican spotted owl, *Strix occidentalis lucida*, Listed Threatened	✓	✓	✓	✓			✓		✓		✓	✓	✓		✓		
Piping plover, *Charadrius melodus*, Listed Threatened	▲		▲			✓	▲	▲			▲			✓			▲
Southwestern willow flycatcher, *Empidonax traillii extimus*, Listed Endangered		✓		✓								✓	✓				
Whooping crane, *Grus americana*, Listed Endangered	▲		▲				▲	▲			▲						▲
Yellow-billed cuckoo, *Coccyzus americanus*, Candidate for Listing		✓		✓								✓	✓			✓	
Black-footed ferret, *Mustela nigripes*, Listed Endangered	✓	✓	✓	✓	✓	✓		✓		✓		✓	✓	✓		✓	
Canada lynx, *Lynx* canadensis, Listed Threatened		✓		✓			✓		✓		✓	✓	✓		✓	✓	
Preble's meadow jumping mouse, *Zapus hudsonius preblei*, Listed Threatened	✓		✓				✓	✓									✓
Boreal toad, *Bufo boreas boreas*, Candidate for Listing				✓			✓		✓		✓	✓				✓	

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COUNTIES	ADAMS	ALAMOSA	ARAPAHOE	ARCHULETA	BACA	BENT	BOULDER	BROOMFIELD	CHAFFEE	CHEYENNE	CLEAR CREEK	CONEJOS	COSTILLA	CROWLEY	CUSTER	DELTA	DENVER
Arkansas darter, *Etheostoma cragini*, Candidate for Listing					✓	✓				✓				✓			
Bonytail, *Gila elegans*, (presumed-historical) Listed Endangered																✓	
Colorado pikeminnow, *Ptychocheilus lucius*, Listed Endangered				*												©	
Greenback cutthroat trout, *Oncorhynchus clarki stomias*, Listed Threatened							✓				✓				✓		
Humpback Chub, *Gila cypha*, Listed Endangered																✓	
Pallid sturgeon, *Scaphirhynchus albus*, Listed Endangered	▲		▲				▲	▲			▲						▲
Razorback sucker, *Xyrauchen texanus*, Listed Endangered				*												©	
Clay-loving wild buckwheat, *Eriogonum pelinophilum*, Listed Endangered																✓	
Colorado butterfly plant, *Gaura neomexicana* ssp. *coloradensis*, Listed Threatened	✓		✓				✓	✓									✓
Uinta Basin hookless cactus, *Sclerocactus glaucus*, Listed Threatened																✓	
Uncompahgre fritillary butterfly, *Boloria acrocnema*, Listed Endangered									✓								
Ute ladies'-tresses, *Spiranthes diluvialis*, Listed Threatened	✓		✓				✓	✓									✓

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COUNTIES →	DOLORES	DOUGLAS	EAGLE	ELBERT	EL PASO	FREMONT	GARFIELD	GILPIN	GRAND	GUNNISON	HINSDALE	HUERFANO	JACKSON	JEFFERSON	KIOWA	KIT CARSON
Bald eagle, *Haliaeetus leucocephalus*, Listed Threatened	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, *Centrocercus minimus*, Candidate for Listing	✓		✓				✓			✓						
Least tern (interior population), *Sterna antillarum*, Listed Endangered		▲		▲	▲			▲					▲	▲	✓	
Lesser prairie chicken, *Tympanuchus pallidicinctus*, Candidate for List															✓	
Mexican spotted owl, *Strix occidentalis lucida*, Listed Threatened	✓	✓			✓	✓	✓	✓				✓		✓		
Piping plover, *Charadrius melodus*, Listed Threatened		▲		▲	▲			▲					▲	▲	✓	
Southwestern willow flycatcher, *Empidonax traillii extimus*, Listed Endangered	✓										✓					
Whooping crane, *Grus americana*, Listed Endangered		▲		▲	▲			▲					▲	▲		
Yellow-billed cuckoo, *Coccyzus americanus*, Candidate for Listing	✓		✓				✓		✓	✓	✓					
Black-footed ferret, *Mustela nigripes*, Listed Endangered		✓	✓	✓	✓	✓									✓	✓
Canada lynx, *Lynx canadensis*, Threatened	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓		
Preble's meadow jumping mouse, *Zapus hudsonius preblei*, Listed Threatened		©		✓	✓									©		
Arkansas darter, *Etheostoma cragini*, Candidate for Listing				✓	✓	✓						✓			✓	
Bonytail, *Gila elegans*, (presumed-historical) Listed Endangered	*		*				✓		*	*	*					
Colorado pikeminnow, *Ptychocheilus lucius*, Listed Endangered	*		*				©		*	*	*					
Greenback cutthroat trout, *Oncorhynchus clarki stomias*, Listed Threatened		✓			✓							✓				
Humpback Chub, *Gila cypha*, Listed Endangered	*		*				✓		*	*	*					

COUNTIES→

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1

	DOLORES	DOUGLAS	EAGLE	ELBERT	EL PASO	FREMONT	GARFIELD	GILPIN	GRAND	GUNNISON	HINSDALE	HUERFANO	JACKSON	JEFFERSON	KIOWA	KIT CARSON
Pallid sturgeon, *Scaphirhynchus albus*, Listed Endangered		▲		▲	▲			▲					▲	▲		
Razorback sucker, *Xyrauchen texanus*, Listed Endangered	*		*				©		*	*	*					
Pawnee montane skipper, *Hesperia leonardus montana*, Listed Threatened		✓												✓		
Uncompahgre fritillary butterfly, *Boloria acrocnema*, Listed Endangered	✓		✓							✓	✓					
Boreal toad, *Bufo boreas boreas*, Candidate for Listing	✓		✓				✓	✓	✓	✓	✓		✓			
Colorado butterfly plant, *Gaura neomexicana* ssp. *coloradensis*, Listed Threatened		✓			✓									✓		
De Beque phacelia, *Phacelia submutica*, Candidate for Listing							✓									
North Park phacelia, *Phacelia formosula*, Listed Endangered													✓			
Osterhout milkvetch, *Astragalus osterhoutii*, Listed Endangered									✓							
Parachute beardtongue, *Penstemon debilis*, Candidate for Listing							✓									
Penland beardtongue, *Penstemon penlandii*, Listed Endangered									✓							
Slender moonwort, *Botrychium lineare*, Candidate for Listing					✓											
Uinta Basin hookless cactus, *Sclerocactus glaucus*, Listed Threatened							✓									
Ute ladies'-tresses, *Spiranthes diluvialis*, Listed Threatened		✓			✓									✓		

COUNTIES →

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1

	LAKE	LA PLATA	LARIMER	LAS ANIMAS	LINCOLN	LOGAN	MESA	MINERAL	MOFFAT	MONTEZUMA	MONTROSE	MORGAN	OTERO	OURAY	PARK	PHILLIPS
Bald eagle, *Haliaeetus leucocephalus*, Listed Threatened	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, *Centrocercus minimus*, Candidate for Listing		✓					✓			✓	✓			✓		
Least tern (interior population), *Sterna antillarum*, Listed Endangered			▲		▲	▲						✓	✓		▲	
Lesser prairie chicken, *Tympanuchus pallidicinctus*, Candidate for Listing					✓											
Mexican spotted owl, *Strix occidentalis lucida*, Listed Threatened		✓	✓	✓					✓	✓	✓				✓	
Piping plover, *Charadrius melodus*, Listed Threatened			▲		▲	✓						✓	✓		▲	
Southwestern willow flycatcher, *Empidonax traillii extimus*, Listed Endangered		✓						✓		✓						
Yellow-billed cuckoo, *Coccyzus americanus*, Candidate for Listing		✓					✓	✓	✓	✓	✓			✓		
Whooping crane, *Grus americana*, Listed Endangered			▲		▲	▲						▲			▲	
Black-footed ferret, *Mustela nigripes*, Listed Endangered		✓	✓	✓	✓				✓	✓	✓	✓	✓			
Canada lynx, *Lynx canadensis*, Listed Threatened	✓	✓	✓	✓			✓	✓	✓	✓	✓			✓	✓	
Preble's meadow jumping mouse, *Zapus hudsonius preblei*, Listed Threatened			©									✓				
Arkansas darter, *Etheostoma cragini*, Candidate for Listing				✓	✓								✓			
Bonytail, *Gila elegans*, (presumed-historical) Listed Endangered							©		©		*			*		
Colorado pikeminnow, *Ptychocheilus lucius*, Listed Endangered		*					©	*	©	*	*			*		
Greenback cutthroat trout, *Oncorhynchus clarki stomias*, Listed Threatened	✓		✓												✓	
Humpback chub, *Gila cypha*, Listed Endangered							©		©		*			*		

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1

COUNTIES →	LAKE	LA PLATA	LARIMER	LAS ANIMAS	LINCOLN	LOGAN	MESA	MINERAL	MOFFAT	MONTEZUMA	MONTROSE	MORGAN	OTERO	OURAY	PARK	PHILLIPS
Pallid sturgeon, *Scaphirhynchus albus*, Listed Endangered			▲		▲	▲						▲			▲	
Razorback sucker, *Xyrauchen texanus*, Listed Endangered		*					©	*	©	*	*			*		
Boreal toad, *Bufo boreas boreas*, Candidate for Listing	✓	✓	✓				✓	✓	✓	✓				✓	✓	
Pawneé montane skipper, *Hesperia leonardus montana*, Listed Threatened															✓	
Uncompahgre fritillary butterfly, *Boloria acrocnema*, Listed Endangered	✓	✓						✓						✓	✓	
Clay-loving wild buckwheat, *Eriogonum pelinophilum*, Listed Endangered											✓					
Colorado butterfly plant, *Gaura neomexicana* ssp. *coloradensis*, Listed Threatened			✓													
De Beque phacelia, *Phacelia submutica*, Candidate for Listing							✓									
Knowlton's cactus, *Pediocactus knowltonii*, Listed Endangered		✓														
Mancos milkvetch, *Astragalus humillimus*, Listed Endangered										✓						
Mesa Verde cactus, *Sclerocactus mesae-verdae*, Listed Threatened										✓						
Penland alpine fen mustard, *Eutrema penlandii*, Listed Threatened	✓														✓	
Sleeping Ute milk-vetch, *Astragalus tortipes*, Candidate for Listing										✓						
Slender moonwort, *Botrychium lineare*, Candidate for Listing	✓															
Uinta Basin hookless cactus, *Sclerocactus glaucus*, Listed Threatened							✓				✓					
Ute ladies'-tresses, *Spiranthes diluvialis*, Listed Threatened			✓									✓				

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FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO
1

COUNTIES →	PITKIN	PROWERS	PUEBLO	RIO BLANCO	RIO GRANDE	ROUT	SAGUACHE	SAN JUAN	SAN MIGUEL	SEDGWICK	SUMMIT	TELLER	WASHINGTON	WELD	YUMA
Bald eagle, *Haliaeetus leucocephalus*, Listed Threatened	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, *Centrocercus minimus*, Candidate for Listing	✓				✓		✓		✓						
Least tern (interior population), *Sterna antillarum*, Listed Endangered		✓								✓		▲	▲	▲	
Lesser prairie chicken, *Tympanuchus pallidicinctus*, Candidate for Listing		✓													
Mexican spotted owl, *Strix occidentalis lucida*, Listed Threatened	✓		✓		✓		✓		✓		✓	✓		✓	
Piping plover, *Charadrius melodus*, Listed Threatened		✓								✓		▲	▲	▲	
Southwestern willow flycatcher, *Empidonax traillii extimus*, Listed Endangered					✓		✓	✓	✓						
Whooping crane, *Grus americana*, Listed Endangered										▲		▲	▲	▲	
Yellow-billed cuckoo, *Coccyzus americanus*, Candidate for Listing	✓			✓	✓	✓	✓	✓	✓		✓				
Black-footed ferret, *Mustela nigripes*, Listed Endangered		✓	✓	✓			✓		✓				✓	✓	
Canada lynx, *Lynx canadensis*, Listed Threatened	✓		✓	✓	✓	✓	✓	✓	✓		✓				
Preble's meadow jumping mouse, *Zapus hudsonius preblei*, Listed Threatened												©		✓	
Pawnee montane skipper, *Hesperia leonardus montana*, Listed Threatened												✓			
Uncompahgre fritillary butterfly, *Boloria acrocnema*, Listed Endangered	✓				✓		✓	✓	✓		✓				
Arkansas darter, *Etheostoma cragini*, Candidate for Listing		✓	✓												
Bonytail, *Gila elegans*, (presumed-historical) Listed Endangered	*			*		*	*		*		*				
Colorado pikeminnow, *Ptychocheilus lucius*, Listed Endangered	*			©	*	*	*	*	*		*				

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FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO
1

COUNTIES →	PITKIN	PROWERS	PUEBLO	RIO BLANCO	RIO GRANDE	ROUTT	SAGUACHE	SAN JUAN	SAN MIGUEL	SEDGWICK	SUMMIT	TELLER	WASHINGTON	WELD	YUMA
Greenback cutthroat trout, *Oncorhynchus clarki stomias*, Listed Threatened			✓												
Humpback Chub, *Gila cypha*, Listed Endangered	*			*		*	*		*		*				
Pallid sturgeon, *Scaphirhynchus albus*, Listed Endangered										▲		▲	▲	▲	
Razorback sucker, *Xyrauchen texanus*, Listed Endangered	*			*	*	*	*	*	*		*				
Boreal toad, *Bufo boreas boreas*, Candidate for Listing	✓			✓	✓	✓	✓	✓	✓		✓				
Colorado bufterfly plant, *Gaura neomexicana* spp. *coloradensis*, Listed Threatened			✓											✓	
Dudley Bluffs (Piceance) twinpod, *Physaria obcordata*, Listed Threatened				✓											
Dudley Bluffs bladderpod, *Lesquerella congesta*, Listed Threatened				✓											
Graham beardtongue, *Penstemon grahamii*, Candidate for Listing				✓											
Penland alpine fen mustard, *Eutrema penlandii*, Listed Threatened											✓				
Ute ladies'-tresses, *Spiranthes diluvialis*, Listed Threatened														✓	
White River beardtongue (penstemon), *Penstemon scariosus* var. *albifluvis*, Candidate for Listing				✓											

TABLE TERMINOLOGY

✓	The check mark indicates that the species is present in that county or that the county is within the historical range of the species
*	Water depletions in the Upper Colorado River and San Juan River basins, in these counties may affect these species
▲	Water depletions in the North or South Platte rivers, in these counties may affect these species
©	The species is present in the county and there is designated critical habitat for the species within the county
Candidate	Means there is sufficient information indicating that formal listing under the ESA may be appropriate
Proposed	Means the species is proposed for possible addition to the Lists of Endangered and Threatened Wildlife and Plants under the ESA
Endangered	Means the species could become extinct
Threatened	Means the species could become endangered

APPENDIX D:

COLORADO STATE-LISTED TEP&C SPECIES

For information on the wildlife species, click on the common name.

NOTE: Some files are in pdf format. To read these files, you'll need ***Adobe Acrobat Reader***. If you don't have Acrobat or if you are having trouble viewing the files and you already have Adobe, go to the " Adobe Acrobat Page."

COMMON NAME	SCIENTIFIC NAME	STATUS[1]
FISH		
Bonytail Profile OR Wildlife in Danger Profile	Gila elegans	FE, SE
Razorback Sucker OR Wildlife in Danger Profile	Xyrauchen texanus	FE, SE
Humpback Chub OR Wildlife in Danger Profile	Gila cypha	FE, ST
Colorado Pikeminnow OR Wildlife in Danger Profile	Ptychocheilus lucius	FE, ST
Greenback Cutthroat Trout OR Wildlife in Danger Profile	Oncorhynchus clarki stomias	FT, ST
Rio Grande Sucker	Catostomus plebeius	SE
Lake Chub	Couesius plumbeus	SE
Plains minnow	Hybognathus placitus	SE
Suckermouth Minnow	Phenacobius mirabilis	SE
Northern Redbelly Dace	Phoxinus eos	SE
Southern Redbelly Dace	Phoxinus erythrogaster	SE
Brassy Minnow	Hybognathus hankinsoni	ST
Common shiner	Luxilus cornutus	ST
Arkansas Darter	Etheostoma cragini	ST
Mountain Sucker	Catostomus playtrhynchus	SC
Plains Orangethroat Darter	Etheostoma spectabile	SC
Iowa Darter	Etheostoma exile	SC
Rio Grande Chub	Gila pandora	SC
Colorado Roundtail Chub	Gila robusta	SC
Stonecat	Noturus flavus	SC
Colorado River Cutthroat Trout	Oncorhynchus clarki pleuriticus	SC
Rio Grande Cutthroat Trout	Oncorhynchus clarki virginalis	SC

COMMON NAME	SCIENTIFIC NAME	STATUS[1]
Flathead Chub	Platygobio gracilus	SC
AMPHIBIANS		
Boreal Toad OR Wildlife in Danger Profile	Bufo boreas boreas	SE
Northern Cricket Frog	Acris crepitans	SC
Great Plains narrowmouth toad	Gastrophryne olivacea	SC
Northern leopard frog	Rana pipiens	SC
Wood Frog	Rana sylvatica	SC
Plains Leopard Frog	Rana blairi	SC
Couch's spadefoot	Scaphiopus couchii	SC
REPTILES		
Triploid checkered whiptail	Cnemidophorus neotesselatus	SC
Midget faded rattlesnake	Crotalus viridis concolor	SC
Longnose leopard lizard	Gambelia wislizenii	SC
Yellow mud turtle	Kinosternon flavescens	SC
Common kingsnake	Lampropeltis getula	SC
Texas blind snake	Leptotyphlops dulcis	SC
Texas horned lizard	Phrynosoma cornutum	SC
Roundtail horned lizard	Phrynosoma modestum	SC
Massasauga	Sistrurus catenatus	SC
Common garter snake	Thamnophis sirtalis	SC
MOLLUSKS		
Rocky Mountain Capshell	Acroloxus coloradensis	SC
Cylindrical papershell	Anodontoides ferussacianus	SC
BIRDS		
Whooping Crane OR Wildlife in Danger Profile	Grus americana	FE, SE
Least Tern	Sterna antillarum	FE, SE
Southwestern Willow Flycatcher	Empidonax traillii extimus	FE, SE

COMMON NAME	SCIENTIFIC NAME	STATUS[1]
Plains Sharp-Tailed Grouse	Tympanuchus phasianellus jamesii	SE
Piping Plover	Charadrius melodus circumcinctus	FT, ST
Bald Eagle OR Wildlife in Danger Profile	Haliaeetus leucocephalus	FT, ST
Mexican Spotted Owl	Strix occidentalis lucida	FT, ST
Burrowing Owl OR Wildlife in Danger Profile	Athene cunicularia	ST
Lesser Prairie-Chicken OR Wildlife in Danger Profile	Tympanuchus pallidicinctus	ST
Western Yellow-billed Cuckoo	Coccyzus americanus	SC
Greater Sandhill Crane OR Wildlife in Danger Profile	Grus canadensis tabida	SC
Ferruginous Hawk	Buteo regalis	SC
Gunnison Sage-grouse Profile and Rangewide Conservation Plan	Centrocercus minimus	SC
American Peregrine Falcon OR Wildlife in Danger Profile	Falco peregrinus anatum	SC
Greater Sage Grouse	Centrocercus urophasianus	SC
Western Snowy Plover	Charadrius alexandrinus	SC
Mountain Plover	Charadrius montanus	SC
Long-Billed Curlew	Numenius americanus	SC
Columbian sharp-tailed Grouse	Tympanuchus phasianellus columbianus	SC
MAMMALS		
Gray Wolf OR Wildlife in Danger Profile	Canis lupus	FE, SE
Black-Footed Ferret	Mustela nigripes	FE, SE
Grizzly Bear OR Wildlife in Danger Profile	Ursus arctos	FT, SE

COMMON NAME	SCIENTIFIC NAME	STATUS[1]
Preble's Meadow Jumping Mouse - Wildlife in Danger Profile	Zapus hudsonius preblei	FT, ST
Lynx	Lynx canadensis	FT, SE
Wolverine OR Wildlife in Danger Profile	Gulo gulo	SE
River otter OR Wildlife in Danger Profile	Lontra canadensis	ST
Kit Fox OR Wildlife in Danger Profile	Vulpes macrotis	SE
Townsend's big-eared bat (pale ssp)	Corynorhinus townsendii pallescens	SC
Black-tailed Prairie Dog	Cynomys ludovicianus	SC
Botta's Pocket Gopher (rubidus ssp)	Thomomy bottae rubidus	SC
Northern pocket gopher (macrotis ssp)	Thomomys talpoides macrotis	SC
Swift fox	Vulpes velox	SC

[1]Status Codes:

FE = Federally Endangered
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
SC = State Special Concern (not a statutory category)

APPENDIX E:

RESULTS OF COLORADO NATURAL HERITAGE
PROGRAM DATABASE SEARCH

Colorado State University

Knowledge to Go Places

Colorado Natural Heritage Program
Colorado State University
8002 Campus Delivery
Fort Collins, Colorado 80523-8002
(970) 491-1309
FAX: (970) 491-3349
www.cnhp.colostate.edu

October 20, 2004

Karyn Coppinger
TRC Solutions
605 Skyline Drive
Laramie, WY 82070

Dear Karyn:

The Colorado Natural Heritage Program (CNHP) is in receipt of your request for information regarding the TRC area of interest in Logan County. In response, I have searched our Biological and Conservation Datasystem (BCD) for natural heritage elements (occurrences of significant natural communities and rare, threatened or endangered plants and animals) documented from the vicinity of the area specified in your request, specifically within the following USGS 7.5' Minute Quadrangles: Peetz and Haystack Butte.

The enclosed report describes natural heritage resources known from this area and gives location (by Township, Range, and Section), precision information, and the date of last observation of the element at that location. This report includes elements known to occur within the specified project site, as well as elements known from similar landscapes near the site. Please note that "precision" reflects the resolution of original data. For example, an herbarium record from "4 miles east of Colorado Springs" provides much less spatial information than a topographic map showing the exact location of the occurrence. "Precision" codes of Seconds, Minutes, and General are defined in the footer of the enclosed report.

The report also outlines the status of known elements. We have included status according to Natural Heritage Program methodology and legal status under state and federal statutes. Natural Heritage ranks are standardized across the Heritage Program network, and are assigned for global and state levels of rarity. They range from "1" for critically imperiled or extremely rare elements, to "5" for those that are demonstrably secure.

You may notice that some occurrences do not have sections listed. Those species have been designated as "sensitive" due to their rarity and threats by human activity. Peregrine falcons, for example, are susceptible to human breeders removing falcon eggs from their nests. For these species, CNHP does not normally provide location information beyond township and range. Please contact us should you require more detailed information for sensitive occurrences.

There are no CNHP designated Potential Conservation Areas located within your project area. In order to successfully protect populations or occurrences, it is necessary to delineate conservation areas. These conservation areas focus on capturing the ecological processes that are necessary to support the continued existence of a particular element of natural heritage significance. Conservation areas may include a single occurrence of a rare element or a suite of rare elements or significant features.

Natural Heritage Program
COLORADO

The goal of the process is to identify a land area that can provide the habitat and ecological processes upon which a particular element or suite of elements depends for their continued existence. The best available knowledge of each species' life history is used in conjunction with information about topographic, geomorphic, and hydrologic features, vegetative cover, as well as current and potential land uses. The proposed boundary does not automatically exclude all activity. It is hypothesized that some activities will cause degradation to the element or the process on which they depend, while others will not. Consideration of specific activities or land use changes proposed within or adjacent to the preliminary conservation planning boundary should be carefully considered and evaluated for their consequences to the element on which the conservation unit is based.

The Colorado Division of Wildlife has legal authority over wildlife in the state. CDOW would therefore be responsible for the evaluation of and final decisions regarding any potential effects a proposed project may have on wildlife. If you would like more specific information regarding these or other vertebrate species in the vicinity of the area of interest, please contact the Colorado Division of Wildlife.

The information contained herein represents the results of a search of Colorado Natural Heritage Program's (CNHP) Biological and Conservation Data System (BCD), and can be used as notice to anticipate possible impacts or identify areas of interest. Care should be taken in interpreting these data. Sensitive elements are currently known from within the proposed project area, and additional, but undocumented, elements may also exist (see enclosed report). Please note that the absence of data for a particular area, species, or habitat does not necessarily mean that these natural heritage resources do not occur on or adjacent to the project site, rather that our files do not currently contain information to document their presence. CNHP information should not replace field studies necessary for more localized planning efforts, especially if impacts to wildlife habitat are possible.

Although every attempt is made to provide the most current and precise information possible, please be aware that some of our sources provide a higher level of accuracy than others, and some interpretation may be required. CNHP's data system is constantly updated and revised. Please contact CNHP for an update or assistance with interpretation of this natural heritage information.

Sincerely,

Michael Menefee
Environmental Review Coordinator

Enc.

Natural Heritage Program
COLORADO

Colorado Natural Heritage Program Environmental Review

Locations and Status of Rare and/or Imperiled Species and Natural Communities known from or likely to occur within the following USGS 7.5' Minute Quadrangles: Peetz & Haystack Butte in Logan County, Colorado

Report generated: 20 October 2004

EO_ID	major group	scientific name	common name	prec	last obs	trs	grank	srank	eorank	ESA	fed stat	st stat
12,022	Birds	*Calcarius mccownii*	Mccown's Longspur	S	2002-06-29	011N051W 18; 011N052W 13;	G4	S2B	E		USFS	

precision codes: S = "seconds", location known within 100m; M = "minutes", location known within 1 mile; G = "general", location known within 5 miles

APPENDIX F:

BIOLOGICAL ASSESSMENT

APPENDIX F:

BIOLOGICAL ASSESSMENT
Spring Canyon Wind Project
Logan County, Colorado
formerly known as
The Peetz Table Wind Project

Prepared for

U.S. Department of Energy
Western Area Power Administration
Rocky Mountain Region
Loveland, Colorado

May 2005

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F-1.0 INTRODUCTION

Spring Canyon Energy LLC (SCE), a wholly owned affiliate of Invenergy LLC, applied to the Western Area Power Administration (Western) to interconnect a 130-megawatt (MW) wind power facility to Western's existing 230-kilovolt (kV) Sidney to North Yuma transmission line. Phase I would consist of about 60 MW to be constructed in 2005, pending successful completion of the environmental review process. The size and timing for construction of subsequent phases is not known at this time, but the entire 130-MW project is evaluated in this Biological Assessment (BA). Although the project would have an installed capacity of 130-MW, it is expected to operate at about 38% capacity, so actual output would average about 49 MW. The determinations made herein will be re-evaluated prior to construction of subsequent phases. The Spring Canyon wind project, formerly known as the Peetz Table wind project, would be constructed on private land located east of Peetz, Logan County, Colorado (Figure F-1.1). SCE has obtained or will obtain leases from the private landowners to construct and operate the wind project. Western is the lead federal agency for compliance with the *National Environmental Policy Act of 1969* (NEPA), as amended. There are no cooperating agencies. This BA was prepared in accordance with the *Endangered Species Act* (ESA) to assess the impacts of constructing and operating the wind project on threatened, endangered, proposed, or candidate (TEP&C) species, which Western's execution of the interconnect agreement (a federal action) would enable. For the purposes of this BA, the project area includes all land within the red "Project Area" boundary shown on Figure F-1.1.

The entire wind project would consist of approximately 87 1.5-MW or 72 1.8-MW wind turbines and associated facilities (Phase I would consist of about 40 turbines). The wind turbine generators would be supported by 262-ft tubular towers (Figure F-1.2). Support facilities would include step-up transformers, a substation, underground and overhead power collection and communication lines, roads, and an operation and maintenance (O&M) facility.

Access to the project area would be via Colorado Highway 113 and a network of existing county roads within the project area. Access to wind project facilities, including individual turbines, would be provided by new access roads to be constructed for the purposes of wind project construction and operation. In addition, during construction a large crane would be used to erect towers and turbines, and it would be walked either along project access roads, along collection line corridors, or cross-country along corridors hereafter referred to as crane paths.

The entire project area occupies about 22,054 acres. Of that, the entire 130-MW project would disturb about 222 acres initially and 69 acres for the life-of-project (Table F-1.1). The 60-MW Phase I project would disturb about half of this amount.

Table F-1.1 Estimated Disturbance.

Disturbance Type	Initial Disturbance (acres)	Life-of-project Disturbance (acres)
Turbine assembly areas/pads[1]	80	3
Turbine string corridors (collection line trenches and access roads)[2]	102	47
Other access roads (outside turbine corridors)[3]	8	4
Staging areas and turnarounds[4]	5	5
Collection line trenches (outside turbine corridors)[5]	14	0
Crane paths[6]	0	0
Overhead collection lines[7]	3	<0.1
Substation	10	10
Total	222	69

1 Assumes a 200 x 200-ft assembly area during construction and a 40 x 40-ft permanent pad; assumes 87 turbines.

2 Assumes 24 mi of corridors, 35 ft wide during construction, reclaimed to 16 ft wide for the life-of-project.

3 Assumes 2 mi of access roads outside of turbine corridors, 35 ft wide during construction, reclaimed to 16 ft wide for the life-of-project.

4 Assumes five 1-acre staging areas/turnarounds.

5 Assumes 28 mi of collection line trenches outside turbine corridors, up to 4 ft wide during construction, completely reclaimed for the life-of-project.

6 Crane paths would not be constructed but would result from the overland passage of the large crane.

7 Assumes 1 mi of overhead collection lines, 20 ft wide during construction, reclaimed except for pole locations for life-of-project (100 poles each occupy 2 x 2 ft = 0.01 acre).

F-2.0 CONSULTATION HISTORY

The consultation history, as of April 14, 2005, is provided in Table F-2.1.

Table F-2.1 Summary of Consultation History

Consultation Activity	Date
Letter requesting a species list from Karyn Coppinger, TRC Mariah Associates Inc. (TRC Mariah), on behalf of Western, to Susan Linner, U.S. Fish and Wildlife Service (FWS)	October 28, 2004
On-site visit with Sandy Vana-Miller, FWS; Kirstie Bay, Larry Budde, Larry Crooks, Marty Stratman, and Rick Moss, Colorado Division of Wildlife (CDOW); and Karyn Coppinger and Craig Kling, TRC Mariah	October 29, 2004
Species list and letter received provided to Karyn Coppinger, TRC Mariah, by Susan Linner, FWS	November 22, 2004
Biological Assessment preparation commenced by Karyn Coppinger, TRC Mariah	February 1, 2005
Meeting with Sandy Van-Miller, FWS; Kirstie Bay, CDOW; Rodney Jones and Tracy Custer, Western; Doug Carter, Spring Canyon Energy LLC (SCE); Mike Logsdon, Diamondback Services, Inc.; Brent Orr, attorney; and Karyn Coppinger, TRC Mariah; at Western's office in Loveland	February 9, 2005
Telephone conversation concerning water depletions with Don Anderson, FWS, initiated by Rodney Jones, Western; summarized in email to Karyn Coppinger, TRC Mariah, and Doug Carter, SCE	February 14, 2005
Platte River Biological Opinion provided by Sandy Vana-Miller, FWS, to Karyn Coppinger, TRC Mariah	March 8, 2005

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F-3.0 METHODS

A list of endangered, threatened, proposed, and candidate species that may occur in Logan County was obtained from the U.S. Fish and Wildlife Service (FWS) on November 22, 2004 (Table F-3.1) (Addendum A). The Colorado Natural Heritage Program (CNHP) was queried for information regarding sensitive habitats and threatened and endangered (T&E) species sightings within the project area (Addendum B).

Fieldwork was conducted from February 2-9, 2005, after the turbine locations and proposed access road locations had been staked by SCE and included surveys for habitat and any species within 1,000 ft on either side of each turbine string and proposed new access roads (Figure F-3.1 and Table F-3.2). Therefore, a 2,000-ft wide corridor around all areas to be disturbed was surveyed. In addition, the proposed substation and operation and maintenance building location, including a 200-ft buffer around the substation and operation and maintenance building, was surveyed. The 50-ft wide collection system corridors and crane paths were surveyed on March 31 and April 1. Of the entire 22,054-acre project area, 6,424 acres were surveyed. These surveys were conducted by TRC Mariah Associates Inc. (TRC Mariah) biologists Karyn Coppinger, Larry DeBrey, and Kristy Palmer.

Habitats for species were identified based on current habitat descriptions provided by the FWS. Lists of wildlife species known to occur or that may occur in Logan County were obtained from the Colorado Division of Wildlife (CDOW) (unpublished data). All suitable habitats were mapped using a global positioning system (GPS) either from an all-terrain vehicle or on foot. The GPS data were downloaded into an ArcView geographic information system (GIS) database for the project area, and maps were created.

In addition to TEP&C species habitat mapping, preliminary raptor nest inventories were conducted on October 27, 2004, and on March 28 and 29, 2005, to determine if bald eagle nesting habitat or nests occurred in the project area. All suitable raptor nesting habitat was searched for nests using the naked eye, binoculars, or a spotting scope. All nest locations

Table F-3.1 Federally Listed Species That May Occur in Logan County, Colorado.[1]

Species	Habitat	Potential to Occur in Project Area or to be Affected by the Project
Bald eagle	Breeding and nesting habitat includes rivers, lakes, and reservoirs with forested shorelines of cliffs; winter roosting areas include large trees in sheltered areas near open water; forages widely	No suitable breeding or nesting habitat or winter roost areas occur in the project area; suitable foraging habitat present; flyovers likely
Interior least tern[2]	Breeds and nests in riverine areas with sparsely vegetated sand and gravel bars within wide, unobstructed river channels or salt flats along lake shorelines	No suitable breeding or nesting habitat in project area; known to occur in Logan County; possible flyovers during migration; occurs in the South Platte River, downstream from the project area
Pallid sturgeon[2]	Bottoms of large, turbid, relatively warm free-flowing rivers	Occurs in the South Platte River, downstream from the project area
Piping plover[2]	Wide, sparsely vegetated sand or gravel beaches adjacent to vast alkali lakes; washed-out hillside beaches on smaller, semi-permanent alkali wetlands; beaches, sand flats, and floodplains; forage near water	No suitable breeding or nesting habitat in project area; known to occur in Logan County; possible flyovers during migration; occurs in the South Platte River, downstream from the project area
Whooping crane[2]	Breeding and nesting occurs in Wood Buffalo National Park, Alberta and Northwest Territories, Canada; they winter in Aransas National Park, Texas; whooping cranes use a variety of habitats during migration including cropland, wetlands, and riverine habitat	No breeding or nesting habitat occurs in the project area; known to occur in Logan County; possible flyovers and stopovers in cropland during migration; occurs in the South Platte River, downstream from the project area

[1] Source: Letter from Susan Linner, U.S. Fish and Wildlife Service, to Karyn Coppinger, TRC Mariah Associates Inc., November 22, 2004 (see Addendum A).

[2] Water depletions in the South Platte River may affect the species and/or critical habitat in downstream reaches in other states.

Table F-3.2 Survey Summary.

Project Attribute	Survey Corridor Width/Area	Survey Dates	Personnel
Turbine strings	2,000 ft	Feb 2-9, 2005	Larry DeBrey and Kristy Palmer
Access roads	2,000 ft	Feb 2-9, 2005	Larry DeBrey and Kristy Palmer
Crane paths	50 ft	Mar 31-Apr 1, 2005	Karyn Coppinger
Collection line corridors	50 ft	Mar 31-Apr 1, 2005	Karyn Coppinger
Substation and O&M building	26 acres[1]	Feb 2-9, 2005	Larry DeBrey and Kristy Palmer
Project Area	All suitable raptor nesting habitat	Oct 27, 2004; Mar 28-29, 2005	Larry DeBrey and Diane Thomas

[1] Includes a 10-acre construction site plus a 200-ft buffer.

(regardless of species) were mapped on a 7.5' topographic map, photographs were taken, and a raptor nest inventory data sheet was completed. These surveys were conducted by TRC Mariah biologists Larry DeBrey and Diane Thomas.

On January 29, 2005, Karyn Coppinger (TRC Mariah) was on-site conducting other business and observed a bald eagle perched on the ground in a farmed field.

No federally listed plant species are expected to occur in Logan County. Plant species are not discussed further in this BA.

F-4.0 OVERVIEW OF THE PROJECT AREA

Project area vegetation is a mosaic of farmland (12,660 acres or 57% of the project area), Conservation Reserve Program (CRP) land (2,300 acres [10%]), native prairie (7,094 acres [32%]), and shelterbelts (scattered throughout the project area) (see Figure F-3.1). Principal crops are winter wheat and millet. Some areas are interseeded and used for hay and/or pasture for livestock. CRP land typically contains a mixture of tall and short grasses and may be grazed by livestock or returned to crop production when the CRP contract expires, unless the CRP is extended and these areas are re-enrolled. Native vegetation is typical of shortgrass prairie, with species such as blue grama, buffalograss, western wheatgrass, little bluestem, switchgrass, prairie sandreed, sand dropseed, and sedges common. Shrubs typically include big sagebrush, rabbitbrush, Rocky Mountain juniper, eastern red cedar, yellow current chokecherry, squawbush, wild current, and wild plum. Many farmsteads and abandoned farm sites have an adjacent shelterbelt of trees and shrubs. Most of the shelterbelts on abandoned farmsteads contain decadent/senescent trees.

There are 6,424 acres within the 2,000-ft and 50-ft survey corridors, 2,445 acres of which are native prairie, 2,967 acres of which are cropland, and 1,012 acres of which are CRP land. An estimated 84 acres of native prairie, 102 acres of cropland, and 36 acres of CRP land would be disturbed during construction. Life-of-project disturbance would include an estimated 26 acres of prairie, 32 acres of cropland, and 11 acres of CRP land.

The project area provides habitat for a variety of wildlife species typical of agricultural lands and native shortgrass prairie in northeastern Colorado, including big game (pronghorn antelope and mule deer); predator species (coyote, red fox, swift fox, raccoon, long-tailed weasel, mink, American badger, eastern spotted skunk, striped skunk, and, possibly, bobcat and mountain lion) (CDOW unpublished data); small mammals; bats; reptiles; amphibians; and birds.

An estimated 266 species of birds occur in Logan County and may occur in the project area--most species probably occur in the project area only during migration and thus would be

occasional visitors only. Many of the species (i.e., waterfowl, shorebirds, waders) known to occur or potentially occur in Logan County, including bald eagle, whooping crane, interior least tern, and piping plover, would not breed in the project area because no breeding or nesting habitat exists, but they may occasionally visit the project area, feeding in agricultural fields during migration (see Section F-5.0). The project area contains potential breeding and nesting habitat for several species of raptors, but not for bald eagles (see Section F-5.3).

F-5.0 SPECIES ACCOUNTS

The following species accounts were excerpted from the reference FWS species accounts.

F-5.1 BALD EAGLE

The bald eagle was listed endangered in 1967 (32 FR 4001, March 11, 1967), was downlisted to threatened in 1995 (60 FR 35999-36010, July 12, 1995), and was recommended for delisting in 1999 (64 FR 36453-36464, July 6, 1999), but it was determined by the FWS that additional data would be needed before taking this action. Current bald eagle range includes all of the conterminous U.S. and Alaska (FWS 2005a).

Bald eagles require cliffs, large trees, or sheltered canyons associated with concentrated food sources (e.g., fisheries or water fowl concentration areas) for nesting and/or roosting.

The decline of the bald eagle was primarily due to the use of DDT. Eagles contaminated with DDT either failed to produce eggs or produced eggs with thin shells that broke during incubation. Shooting, trapping, and poisoning also contributed to bald eagle decline (FWS 2005a). After DDT was banned and the birds and nests were given more protection, bald eagle populations recovered to the point that they are being considered for delisting (see above). Current threats to bald eagles include loss of nesting habitat due to development on inland rivers and other waterways, as well as along the coasts.

No bald eagle breeding or nesting habitat occurs in the project area. Bald eagles are known to be winter visitors in the region, and the dead trees in shelterbelts scattered throughout the area may provide perching habitat. Although the area is over 20 mi from perennial water that has preferred bald eagle feeding areas including fisheries and waterfowl concentration areas (e.g., the South Platte River, Sterling Reservoir, and Jumbo Reservoir), bald eagles can easily cover this distance while foraging and thus may forage on the project area at any time of year. A bald eagle was observed in the project area perched on the ground in a farmed field on January 28,

2005. (Figure F-3.1 shows the locations of the project area's vegetation types.) The CDOW does not have raptor nest records for this area (personal communication, October 2004, with Byron Gillham, CDOW), so it is not known if bald eagles nest in the general vicinity, but the lack of preferred nesting habitat suggests that bald eagle nesting is unlikely. None of the nests observed in the project area during fall 2004 or spring of 2005 appear to be bald eagle nests.

Impacts to bald eagles could include direct mortality due to collisions with turbines and overhead power lines. In the wind power literature (e.g., National Wind Coordinating Committee 2001), collisions with turbines is a rare event, and, if eagles only infrequently visit the area, potential for collision-related mortality is low. SCE would use state-of-the-art turbine technology, including large unguyed turbines with tubular towers and slow-moving rotors and few perches, which reduce potential for bird collisions. The 1.0 mi overhead of power lines would be designed per the *Suggested Practices for Raptor Protection on Power Lines--the State of the Art in 1996* (Avian Power Line Interaction Committee 1996) to avoid potential electrocution impacts. Bald eagles feed on carrion, among other things, and thus are at risk of collision with vehicles when they feed on road-killed animals, but again, there is low potential for this impact. Eagles may be attracted to the area if construction increases the number of road kills; a recommended mitigation is to set and enforce speed traffic speed limits and to keep carrion off roads if it is noted that bald eagles are attracted to road-killed animals.

No indirect effects, such as displacement from preferred habitat or loss of prey base, are anticipated because the project area does not contain preferred habitat and eagles are likely only rare visitors to the area.

The project may affect, but is not likely to adversely affect, bald eagles.

F-5.2 INTERIOR LEAST TERN

The least tern, including the interior least tern, was listed endangered (50 *Federal Register* [FR] 21784-21792, May 28, 1985) in the U.S., except within 50 mi of the coast (FWS 2005c).

Interior least tern breeding range historically extended from Texas (along the Mississippi, Red, and Rio Grande Rivers) to Montana and from eastern Colorado and New Mexico to southern Indiana (along the Missouri, Arkansas, Mississippi, and Ohio river systems) (FWS 2005c). While the current breeding range is similar, breeding is generally restricted to the less altered river segments.

The interior least tern typically nests in riverine habitats on sparsely vegetated sand and gravel bars within wide unobstructed river channels or on salt flats along lake shorelines (FWS 2005c). However, it has also been documented as nesting in sand and gravel pits, in diked fields in Mississippi, in power plant ash disposal areas, and along reservoir shorelines.

Past threats to the interior least tern have largely resulted from the destruction of nesting islands in the river systems due to reservoir construction or river channelization projects (FWS 2005c) or flood control projects that limit development of sandbars. Alteration of natural river dynamics has also altered vegetation on many remaining islands, rendering them unsuitable for nesting. Current threats include the continued construction of reservoirs and channelization projects, which eliminates or alters the island nesting habitat. Furthermore, there is additional human presence in the form of river recreational activities, including not only the water sports but also utilization of sand bars for coastal beach-type activities, all of which reduces least tern reproduction success.

No suitable breeding or nesting habitat for the interior least tern occurs within the project area. Least tern are known to occur in Logan County (CDOW unpublished data), where the Platte River, about 20 mi south of the project area, serves as a local migration corridor. There are no recorded least tern observations in the project area (CNHP 2004). Least terns may migrate through the project area during spring and fall migration, but, due to the absence of rivers and reservoirs within or near the project, they would be infrequent visitors to the area, mostly in spring and fall.

Impacts to least terns due to collision with wind turbines and the 1.0 mi of overhead power lines would be similar to those described for bald eagles. Impacts to least terns due to surface water depletions in the Platte River are discussed in Section 5.6 below.

F-5.3 PIPING PLOVER

The piping plover was listed threatened (50 FR 50726-50734, December 11, 1985) in its entire range except for the Great Lakes watershed where it was listed endangered (FWS 2005d).

The breeding range of the Northern Great Plains population of the piping plover extends from the alkali wetlands in southeastern Alberta, through southern Saskatchewan, Manitoba, and Ontario, and into Minnesota, northeastern Colorado (Prewitt Reservoir), northwestern Oklahoma, northeastern Montana, North Dakota, South Dakota, Nebraska, and Iowa (FWS 2005d). The piping plover winters primarily on the gulf coast in Texas, Louisiana, Alabama, and Florida. Critical wintering habitat for the Northern Great Plains population was designated in Texas, Louisiana, Alabama, and Florida; critical breeding habitat has been designated in areas of Minnesota, Montana, North Dakota, South Dakota, and Nebraska.

The Northern Great Plains population of piping plover favors wide, sparsely vegetated sand or gravel beaches adjacent to large alkali lakes. Washed-out hillside beaches on smaller lakes adjacent to pastures or rangeland in mid- and shortgrass prairie vegetation may also be utilized. They forage on invertebrates near water.

Piping plover were hunted to near extinction for the hat-making industry during the 1800s (FWS 2005d). Current threats are primarily the loss of vegetated sandbars and river islands due to flood control and navigation activities. Rapidly rising water levels caused by water level regulation policies during nesting and brood-rearing reduces reproductive success. Some sand pit operations entice piping plovers to nest in relatively sterile environments, making it difficult for chicks to find adequate food.

No suitable breeding or nesting habitat for piping plover occurs in the project area, but this species is known to occur in Logan County (CDOW unpublished data) where the Platte River, about 20 mi south of the project area, serves as a preferred migration corridor. There are no recorded piping plover observations in the project area (CNHP 2004). Piping plovers may migrate through the project area during spring and fall migration, but, due to the absence of rivers and reservoirs within or near the project, they would be infrequent visitors to the area, mostly in spring and fall.

Impacts to piping plovers due to collision with wind turbines and the 1.0 mi of overhead power lines would be similar to those described for bald eagles. Impacts to piping plovers due to surface water depletions in the Platte River are discussed in Section 5.6 below.

F-5.4 WHOOPING CRANE

The whooping crane was listed endangered (32 FR 4001, March 11, 1967) except for the nonessential experimental populations in Colorado, Indiana, Florida, New Mexico, Utah, and the western half of Wyoming (66 FR 33903-33917, June 26, 2001; 62 FR 38932-38939, July 21, 1997; and 58 FR 5647-5658, January 22, 1993).

Whooping cranes winter on the Texas Gulf coast, including Aransas National Wildlife Refuge, Texas, and Bosque de Apache NWR, New Mexico (FWS 2005b). They migrate and stage throughout northeastern Montana, the western half of North Dakota, and central portions of South Dakota, Nebraska, Oklahoma, and east-central Texas. The five areas of critical habitat occur in Idaho, Kansas, Nebraska, Oklahoma, and Texas. These areas provide habitat for roosting, resting, and foraging during migration.

Whooping cranes nest in wetlands in Wood Buffalo National Park, Alberta and Northwest Territories, Canada. They utilize a variety of habitats during migration, feeding in croplands and roosting in large wetlands (FWS 2005b). They also roost in riverine habitat, generally on submerged sandbars in wide unobstructed channels away from human disturbance. The Platte

River, approximately 200 mi east of the project area in Nebraska, is a well-known stopover location for migrating whooping cranes. Whooping cranes winter in Aransas National Wildlife Refuge and adjacent islands in Texas.

Past threats to whooping cranes were largely the conversion of the Northern Great Plains to agriculture, especially the conversion of prairie pothole habitat and the increased human activity associated with these practices (FWS 2005b). In addition, rural electrification resulted in the widespread construction of power lines, and collisions with power lines are known to have caused death or injury to at least 19 whooping cranes since 1956. Whooping crane population recovery is slow due to delayed sexual maturity, small clutch size, and low recruitment rates. A short ice-free season in Wood Buffalo National Park also may limit the potential to produce a second clutch of chicks if the first clutch fails. Current threats include obstacles encountered during migration, snow and hail, low temperatures, and drought that causes navigational problems and results in collisions with obstructions. Predators, disease, and shooting are also current threats, as are hurricanes and drought on wintering grounds.

Since whooping cranes adhere to ancestral breeding, migrating, and wintering areas and routes, they are not likely to occupy new habitats, and thus habitat destruction within the occupied range remains a major threat. An accidental petroleum spill along the Texas coast could destroy whooping cranes and their food sources.

No breeding or nesting habitat for whooping cranes occurs in the project area. Whooping cranes are known to occur in Logan County (CDOW unpublished data), but they are typically found in areas around the South Platte River, a preferred migratory corridor, over 20 mi south of the project area. There are no recorded whooping crane observations in the project area (CNHP 2004); there is, however, one recorded whooping crane observation (1979) in Cheyenne County, Nebraska (personal communication, January 2005, with Rick Schneider, Nebraska Wildlife and Parks Commission), which is immediately north of the project area. Whooping cranes may migrate through the project area and possibly stopover in the project area's agricultural fields

(Figure F-4.1) to feed. In general, however, they would be infrequent visitors to the area, mostly in spring and fall.

Impacts to whooping cranes due to collision with wind turbines and the 1.0 mi of overhead power lines would be similar to those described for bald eagles. Impacts to whooping cranes due to surface water depletions in the Platte River are discussed in Section 5.6 below.

F-5.5 PALLID STURGEON

The pallid sturgeon was listed endangered throughout its entire range on September 6, 1990 (FWS 2005e). It is known to occur in Arkansas, Iowa, Illinois, Kansas, Kentucky, Louisiana, Missouri, Montana, North Dakota, Nebraska, South Dakota, and Tennessee. It is one of the rarest fishes in North America (FWS 2002). Since 1980, it has been reported most frequently in the Missouri River between the Marias River and Fort Peck Reservoir; between Fort Peck Dam and Lake Sakakawea; within the lower 70 mi of the Yellowstone River downstream of Fallon, Montana; and in the Missouri and Platte Rivers near Plattsmouth, Nebraska.

Past and current threats to the pallid sturgeon are the destruction and alteration of riverine or aquatic habitats, which have adverse effects on reproduction, growth, and survival (FWS 2002). Impoundments have resulted in reduced sediment discharge and loss of introduced organic matter and woody debris, which in turn has increased river bed degradation and loss of hydrologic connection with shallow backwater areas that are important nursery habitat for larval fish. Channelization, channel stabilization, and snag removal for navigation have also resulted in loss of habitat and food production areas for pallid sturgeon.

No habitat for pallid sturgeon occurs in the project area, but it is a species of concern in Logan County because water depletions in the South Platte River may affect the species and/or critical habitat downstream (see Section 5.6).

F-5.6 WATER DEPLETIONS--WHOOPING CRANE, INTERIOR LEAST TERN, PIPING PLOVER, AND PALLID STURGEON

Indirect impacts could occur if the project resulted in water depletions in the South Platte River. On average, the project would use an estimated 0.2 acre-ft per year (Table F-4.1).

Water for the construction will be obtained from permitted commercial or municipal sources such as a local batch plant in Peetz or Sterling, Colorado, or Sidney, Nebraska, and none of these sources would be required to increase water production to meet project demands. During construction, an estimated 765,085 gallons of water would be used to mix concrete, for dust control, and for compaction. An estimated 754,377 gallons of this amount would be consumed in concrete for turbine foundations and 10,708 would be used to construct the substation. An estimated 761,250 gallons would be used for road construction. An estimated 32,625 gallons (0.1 acre-ft) per year would be used for dust control for the 39-year operational life-of-project.

Table F-5.1 Estimated Water Use Per Year and for the Life-of-Project.

Stage of Project	Yards of Concrete/Facility	Gal/yd	Gal/Facility	No. Facilities	Total Gal
Construction					
Turbines	299	29	8,671	87	754,377
Substation	292	29	8,468	1	8,468
Soil compaction (substation)					2,240
Roads	7,612.5 gal/day for 20 days/month for 5 months				761,250
Total water used during construction					1,526,335
Operation					
Water for dust suppression	32,625 gal/yr for 39 years of operation				1,272,375
Totals and Averages					
Total used for the 40-year life-of-project (construction and operation)					2,798,710
Average water use/yr					69,968
Average water use/yr in acre-ft					0.2

During construction of the 130-MW wind project, an estimated 1,526,335 gallons (4.7 acre-ft) of water would be consumed. During the 39-year operational life-of-project, an additional 1,272,375 gallons (3.9 acre-ft) would be consumed. Total water usage over the life-of-project would be 2,798,710 gallons, so over a 40-year life-of-project, an average of 69,968 gallons (0.2 acre-ft) per year would be consumed.

In 2002, the FWS prepared a biological opinion in its *Revised Intra-Service Section 7 Consultation for Federal Agency Actions Resulting in Minor Water Depletions to the Platte River System* (FWS 2002). The biological opinion covers any federal actions other than wetland restoration projects that result in average annual depletions of 25 acre-ft or less to the Platte River system, regardless of location within the basin. The effects analysis and conservation measures apply only to federally listed species, designated whooping crane habitat, and proposed critical habitat for the piping plover along the Platte River in Nebraska.

In accordance with the above-referenced biological opinion, "Federal agencies should continue to conclude that each action resulting in a depletion of 25-acre feet or less per year to the Platte River system may adversely affect the whooping crane, interior least tern, piping plover, and/or pallid sturgeon, designated whooping crane critical habitat, and proposed piping plover critical habitat" (FWS 2002). Since the Spring Canyon wind project would result in a depletion of less than 25-acre ft/year, the project may adversely affect these species and critical habitats. No mitigation is required because the U.S. Forest Service and the FWS have provided funds to a Fish and Wildlife Foundation account for the purposes of off-setting the adverse effects of federal agency actions resulting in minor water depletions, such as the Spring Canyon wind project.

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F-6.0 LIST OF CONTACTS

Table F-5.1 presents a list of contacts made to assist with the analysis presented in this BA.

Table F-6.1 Consultation and Coordination.

Contact	Affiliation, Location	Date	Purpose of Contact
Federal			
Don Anderson	FWS, Lakewood	March 2005	Information regarding minor depletions
Sandy Vana-Miller	FWS, Lakewood	October 2004; February 2005; March 2005	On-site visit to discuss wildlife issues; wildlife mitigation meeting; information regarding minor depletions
Susan Linner	FWS, Lakewood	November 2004	Provide information on TEP&C species and migratory birds
State			
Kirstie Bay	CDOW, Brush	October 2004; February 2005	On-site visit to discuss wildlife issues; wildlife mitigation meeting
Larry Budde	CDOW, Brush	October 2004	On-site visit to discuss wildlife issues
Larry Crooks	CDOW, Julesburg	October 2004	On-site visit to discuss wildlife issues
Byron Gillham	CDOW, Peetz	October 2004; December 2004	Obtain local information concerning wildlife
Michael Meneffee	CNHP, Fort Collins	October 2004	Database search for sensitive species and communities
Rick Moss	CDOW, retired	October 2004	On-site visit to discuss wildlife issues
Marty Stratman	CDOW, Brush	October 2004	On-site visit to discuss wildlife issues

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F-7.0 LITERATURE CITED

Avian Power Line Interaction Committee 1996. Suggested Practices for Raptor Protection on Power Lines: The state of the art in 1996. Edison Electric Institute. Washington, D.C.

Colorado Division of Wildlife. Unpublished data. Logan County. Known or likely species occurrence. Provided by Kirstie Bay, CDOW, to Karyn Coppinger, TRC Mariah Associates Inc.

Colorado Natural Heritage Program. 2004. Tracked vascular plants and tracked plant communities. <http://www.cnhp.colostate.edu/tracking>. Accessed December 2004.

National Wind Coordinating Committee. 2001. Avian collisions with wind turbines: A summary of existing studies and comparisons to other sources of avian mortality in the United States. National Wind Coordinating Committee Resources Document. 62 pp.

U.S. Fish and Wildlife Service. 2002. Revised intra-service Section 7 consultation for federal agency actions resulting in minor water depletions to the Platte River system. Memorandum to Assistant Regional Director, Ecological Service, Region 6, from Regional Director. 77 pp. + append.

_____. 2005a. Bald eagle (*Haliaeetus leucocephalus*). <http://ecos.fws.gov /docs/life_histories/ B 008.html>. Accessed March 2005.

_____. 2005b. Whooping crane. (*Grus americana*). <http://ecos.fws. gov/ docs/life_histories/ B003.html>. Accessed March 2005.

_____. 2005c. Least tern (*Sterna antillarum*). <http://ecos.fws. gov/d ocs/life_histories / B07N. html>. Accessed March 2005.

_____. 2005d. Piping plover (*Charadrius melodus*). <http://ecos.fws. gov/do cs/life_histories /B079.html>. Accessed March 2005.

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ADDENDUM F-A:

LETTER FROM SUSAN LINNER, U.S. FISH AND WILDLIFE SERVICE,
LAKEWOOD, COLORADO, TO KARYN COPPINGER,
TRC MARIAH ASSOCIATES INC., LARAMIE, WYOMING,
DATED NOVEMBER 22, 2004

Rec. 11-24-04
KDC
File #

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: Wind Energy/WAPA-Invenergy Wind
Mail Stop 65412

NOV 22 2004

Ms. Karyn Coppinger
TRC Solutions
605 Skyline Drive
Laramie, Wyoming 82070-8909

Dear Ms. Coppinger:

The U.S. Fish and Wildlife Service (Service) received your letter dated October 28, 2004, regarding the **proposed Peetz Table Wind Power Project in Logan County, Colorado**. These comments have been prepared under the provisions of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.), the Bald and Golden Eagle Protection Act of 1940 (BGEPA), as amended (16 U.S.C. 668 et. seq.), the Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. 703 et. seq.), and the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4327).

On May 13, 2003, the Service issued *Interim Guidance on Avoiding and Minimizing Impacts to Wildlife from Wind Turbines* (Guidance), which can be found at the following link: http://www.fws.gov/r9dhcbfa/wind.pdf. Similar to the Service's voluntary guidance addressing the siting, construction, operation, and decommissioning of communication towers and the voluntary guidance developed in cooperation with the electric utility industry to minimize bird strikes and electrocutions (APLIC 1994, APLIC 1996), the Guidance is intended to assist the wind energy industry in avoiding or minimizing impacts to wildlife and their habitats. This is accomplished through: (1) proper evaluation of potential Wind Resource Areas (WRAs), (2) proper location and design of turbines and associated structures within WRAs selected for development, and (3) pre- and post-construction research and monitoring to identify and/or assess impacts to wildlife. The Guidance is based on current science and will be updated as new information becomes available; it is voluntary and interim in nature. The Guidance will be evaluated over a 2-year period and then modified as necessary based on field performance, comments from the public, and on the latest scientific and technical discoveries developed in coordination with industry, states, academic researchers, and other Federal agencies. After the 2-year period, the Service plans to develop a complete operations manual for evaluation, site selection, design, construction, operation, and monitoring of wind energy facilities in both terrestrial and aquatic environments.

Data on wildlife use and mortality collected at one wind energy facility are not necessarily applicable to others; each site poses its own set of possibilities for negative effects on wildlife. In addition, the wind industry is rapidly expanding into habitats and regions that have not been well studied. The Service therefore suggests a precautionary approach to site selection and development, and will employ this approach in making recommendations and assessing impacts of wind energy developments. We encourage the wind energy industry to follow the Guidance and, in cooperation with the Service, to conduct scientific research to provide additional information on the impacts of wind energy development on wildlife. We further encourage the industry to look for opportunities to promote bird and other wildlife conservation when planning wind energy facilities (e.g., voluntary habitat acquisition or conservation easements).

The Service is guided by the Fish and Wildlife Service Mitigation Policy (Federal Register 46 (15), January 1981) in evaluating modifications to or loss of habitat caused by development. This policy follows the sequence of steps recommended in the Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of NEPA in seeking to avoid, minimize, or compensate for negative impacts. Mitigation can involve (1) avoiding the impact of an activity by taking no action; (2) minimizing impacts by limiting the degree of activity; (3) rectifying an impact by repairing, rehabilitating, or restoring an affected environment; (4) reducing or eliminating an impact by conducting activities that preserve and maintain the resources; or (5) compensating for an impact by replacing or providing substitute resources or environments.

Any mitigation recommended by the Service for wind energy development would be voluntary on the part of the developer unless made a condition of a Federal license or permit. Mitigation does not apply to "take" of species under the MBTA, BGEPA, or ESA. The goal of the Service under these laws is the elimination of loss of migratory birds and endangered and threatened species due to wind energy development. The Service will actively expand partnerships with regional, national, and international organizations, States, tribes, industry, and environmental groups to meet this goal.

Projects with Federal involvement may require additional analysis under NEPA, ESA, or the National Wildlife Refuge System Administration Act. This includes projects on federally owned lands (e.g., National Wildlife Refuges, National Forests), lands where a Federal permit is required for development (e.g., BLM-administered lands and jurisdictional wetlands), or lands where Federal funds were used for purchase or improvement (some State Wildlife Management Areas).

The Guidance contains a site evaluation process, called the Potential Impact Index (PII), with checklists for pre-development evaluations of potential terrestrial wind energy development sites. This site evaluation protocol was developed by a team of Federal, State, university, and wind energy industry biologists to rank potential terrestrial wind energy development sites by their potential impacts on wildlife. The PII represents a "first cut" analysis of the suitability of a site proposed for development. It does so by estimating use of the site by selected wildlife species as an indicator of potential impact. Emphasis of the PII is on initial site evaluation and is intended to provide more objectivity than simple reconnaissance surveys. There are two steps to follow:

1. Identify and evaluate reference sites, preferably within the general geographic area of the proposed facility. Reference sites are high-quality wildlife areas where wind development would result in the maximum negative impact on wildlife (i.e., sites selected to have the highest possible rank using the protocol). Reference sites are used to determine the comparative risks of developing other potential sites.

2. Evaluate potential development sites to determine risk to wildlife and rank sites against each other using the highest-ranking reference site as a standard. Although high-ranking sites are generally less desirable for wind energy development, a high rank does not necessarily preclude development of a site, nor does a low rank automatically eliminate the need to conduct predevelopment assessments of wildlife resources or post-development assessments of impacts.

Use of this process allows comparison of one site with another with respect to the impacts that would occur to wildlife if the area were developed. The evaluation area for a potential development site should include the "footprint" encompassing all of the turbines and associated structures including transmission lines planned for that proposed facility, and the adjacent wildlife habitats which may be affected by the proximity of the structures. Transmission lines extending outside the footprint may be excluded. All potential development sites within a geographic area should be evaluated before a site is selected for development.

Pre-development evaluations should be conducted by a team that includes Federal and/or State agency wildlife professionals with no vested interest (e.g., monetary or personal business gain) in the sites selected. Teams may also include academic and industry wildlife professionals as available. Any site evaluations conducted by teams that do not include Federal and/or State agency wildlife professionals will not be considered valid evaluations by the Service. The pre-development evaluation may also identify additional studies needed prior to and after development. Post-construction monitoring to identify any wildlife impacts is recommended at all developed sites. Pre- and post-development studies and monitoring may be conducted by any qualified wildlife biologist without regard to his/her affiliation or interest in the site.

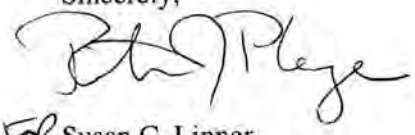
Please also be aware of the potential application of the MBTA and the BGEPA to wind projects involving transmission lines. Protective measures to help reduce possible impacts to migratory birds and other raptors should be installed. 7 CFR § 1724.52 allows for deviations from construction standards for raptor protection, provided that structures are designed and constructed in accordance with *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996* published by the Edison Electric Institute/Raptor Research Foundation. The regulation requires that such structures be in accordance with the National Electrical Safety Code and applicable State and local regulations.

For your convenience, we have enclosed a list of Colorado's threatened and endangered species, as well as the counties in which they are known to occur. We cannot provide site-specific details.

If questions regarding site-specific presence of an endangered species, the extent of its habitat, or the effects of a particular action need to be resolved, the Service recommends that a knowledgeable consultant be contacted to conduct habitat and population assessments or to provide recommendations regarding options under the ESA. Due to staffing constraints, the Colorado Field Office cannot provide you with these services.

If the Service can be of further assistance, please contact Sandy Vana-Miller of my staff at (303) 275-2370.

Sincerely,



For Susan C. Linner
Colorado Field Supervisor

Enclosure: Species List

cc: FWSR6, B. Dach
FWSR6/GJ, E. Mayo
FWSR6/LK, S. Vana-Miller

U. S. Fish and Wildlife Service
Ecological Services
Colorado Field Office

(Effective August 16, 2004)

FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO

COUNTIES	ADAMS	ALAMOSA	ARAPAHOE	ARCHULETA	BACA	BENT	BOULDER	BROOMFIELD	CHAFFEE	CHEYENNE	CLEAR CREEK	CONEJOS	COSTILLA	CROWLEY	CUSTER	DELTA	DENVER
Bald eagle, *Haliaeetus leucocephalus*, Listed Threatened	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, *Centrocercus minimus*, Candidate for Listing		✓		✓					✓			✓	✓			✓	
Least tern (interior population), *Sterna antillarum*, Listed Endangered	▲		▲			✓	▲	▲			▲			✓			▲
Lesser prairie chicken, *Tympanuchus pallidicinctus*, Candidate for Listing					✓	✓				✓				✓			
Mexican spotted owl, *Strix occidentalis lucida*, Listed Threatened	✓	✓	✓	✓			✓		✓		✓	✓	✓		✓		
Piping plover, *Charadrius melodus*, Listed Threatened	▲		▲			✓	▲	▲			▲			✓			▲
Southwestern willow flycatcher, *Empidonax traillii extimus*, Listed Endangered		✓		✓								✓	✓				
Whooping crane, *Grus americana*, Listed Endangered	▲		▲				▲	▲			▲						▲
Yellow-billed cuckoo, *Coccyzus americanus*, Candidate for Listing		✓		✓								✓	✓			✓	
Black-footed ferret, *Mustela nigripes*, Listed Endangered	✓	✓	✓	✓	✓	✓		✓		✓		✓	✓	✓		✓	
Canada lynx, *Lynx* canadensis, Listed Threatened		✓		✓			✓		✓		✓	✓	✓		✓	✓	
Preble's meadow jumping mouse, *Zapus hudsonius preblei*, Listed Threatened	✓		✓				✓	✓									✓
Boreal toad, *Bufo boreas boreas*, Candidate for Listing				✓			✓		✓		✓	✓				✓	

U. S. Fish and Wildlife Service
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1

COUNTIES	ADAMS	ALAMOSA	ARAPAHOE	ARCHULETA	BACA	BENT	BOULDER	BROOMFIELD	CHAFFEE	CHEYENNE	CLEAR CREEK	CONEJOS	COSTILLA	CROWLEY	CUSTER	DELTA	DENVER
Arkansas darter, *Etheostoma cragini*, Candidate for Listing					✓	✓				✓				✓			
Bonytail, *Gila elegans*, (presumed-historical) Listed Endangered																✓	
Colorado pikeminnow, *Ptychocheilus lucius*, Listed Endangered				*												©	
Greenback cutthroat trout, *Oncorhynchus clarki stomias*, Listed Threatened							✓				✓				✓		
Humpback Chub, *Gila cypha*, Listed Endangered																✓	
Pallid sturgeon, *Scaphirhynchus albus*, Listed Endangered	▲		▲				▲	▲			▲						▲
Razorback sucker, *Xyrauchen texanus*, Listed Endangered				*												©	
Clay-loving wild buckwheat, *Eriogonum pelinophilum*, Listed Endangered																✓	
Colorado butterfly plant, *Gaura neomexicana* ssp. *coloradensis*, Listed Threatened	✓		✓				✓	✓									✓
Uinta Basin hookless cactus, *Sclerocactus glaucus*, Listed Threatened																✓	
Uncompahgre fritillary butterfly, *Boloria acrocnema*, Listed Endangered									✓								
Ute ladies'-tresses, *Spiranthes diluvialis*, Listed Threatened	✓		✓				✓	✓									✓

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COUNTIES →	DOLORES	DOUGLAS	EAGLE	ELBERT	EL PASO	FREMONT	GARFIELD	GILPIN	GRAND	GUNNISON	HINSDALE	HUERFANO	JACKSON	JEFFERSON	KIOWA	KIT CARSON
Bald eagle, *Haliaeetus leucocephalus*, Listed Threatened	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, *Centrocercus minimus*, Candidate for Listing	✓		✓				✓			✓						
Least tern (interior population), *Sterna antillarum*, Listed Endangered		▲		▲	▲			▲					▲	▲	✓	
Lesser prairie chicken, *Tympanuchus pallidicinctus*, Candidate for List															✓	
Mexican spotted owl, *Strix occidentalis lucida*, Listed Threatened	✓	✓			✓	✓	✓	✓				✓		✓		
Piping plover, *Charadrius melodus*, Listed Threatened		▲		▲	▲			▲					▲	▲	✓	
Southwestern willow flycatcher, *Empidonax traillii extimus*, Listed Endangered	✓										✓					
Whooping crane, *Grus americana*, Listed Endangered		▲		▲	▲			▲					▲	▲		
Yellow-billed cuckoo, *Coccyzus americanus*, Candidate for Listing	✓		✓				✓		✓	✓	✓					
Black-footed ferret, *Mustela nigripes*, Listed Endangered		✓	✓	✓	✓	✓									✓	✓
Canada lynx, *Lynx canadensis*, Threatened	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓		
Preble's meadow jumping mouse, *Zapus hudsonius preblei*, Listed Threatened		©		✓	✓									©		
Arkansas darter, *Etheostoma cragini*, Candidate for Listing				✓	✓	✓						✓			✓	
Bonytail, *Gila elegans*, (presumed-historical) Listed Endangered	*		*				✓		*	*	*					
Colorado pikeminnow, *Ptychocheilus lucius*, Listed Endangered	*		*				©		*	*	*					
Greenback cutthroat trout, *Oncorhynchus clarki stomias*, Listed Threatened		✓			✓							✓				
Humpback Chub, *Gila cypha*, Listed Endangered	*		*				✓		*	*	*					

COUNTIES→

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1

	DOLORES	DOUGLAS	EAGLE	ELBERT	EL PASO	FREMONT	GARFIELD	GILPIN	GRAND	GUNNISON	HINSDALE	HUERFANO	JACKSON	JEFFERSON	KIOWA	KIT CARSON
Pallid sturgeon, *Scaphirhynchus albus*, Listed Endangered		▲		▲	▲			▲					▲	▲		
Razorback sucker, *Xyrauchen texanus*, Listed Endangered	*		*				©		*	*	*					
Pawnee montane skipper, *Hesperia leonardus montana*, Listed Threatened		✓												✓		
Uncompahgre fritillary butterfly, *Boloria acrocnema*, Listed Endangered	✓		✓							✓	✓					
Boreal toad, *Bufo boreas boreas*, Candidate for Listing	✓		✓				✓	✓	✓	✓	✓		✓			
Colorado butterfly plant, *Gaura neomexicana* ssp. *coloradensis*, Listed Threatened		✓			✓									✓		
De Beque phacelia, *Phacelia submutica*, Candidate for Listing							✓									
North Park phacelia, *Phacelia formosula*, Listed Endangered													✓			
Osterhout milkvetch, *Astragalus osterhoutii*, Listed Endangered									✓							
Parachute beardtongue, *Penstemon debilis*, Candidate for Listing							✓									
Penland beardtongue, *Penstemon penlandii*, Listed Endangered									✓							
Slender moonwort, *Botrychium lineare*, Candidate for Listing					✓											
Uinta Basin hookless cactus, *Sclerocactus glaucus*, Listed Threatened							✓									
Ute ladies'-tresses, *Spiranthes diluvialis*, Listed Threatened		✓			✓									✓		

COUNTIES →

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1

	LAKE	LA PLATA	LARIMER	LAS ANIMAS	LINCOLN	LOGAN	MESA	MINERAL	MOFFAT	MONTEZUMA	MONTROSE	MORGAN	OTERO	OURAY	PARK	PHILLIPS
Bald eagle, *Haliaeetus leucocephalus*, Listed Threatened	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, *Centrocercus minimus*, Candidate for Listing		✓					✓			✓	✓			✓		
Least tern (interior population), *Sterna antillarum*, Listed Endangered			▲		▲	▲						✓	✓		▲	
Lesser prairie chicken, *Tympanuchus pallidicinctus*, Candidate for Listing					✓											
Mexican spotted owl, *Strix occidentalis lucida*, Listed Threatened		✓	✓	✓					✓	✓	✓				✓	
Piping plover, *Charadrius melodus*, Listed Threatened			▲		▲	✓						✓	✓		▲	
Southwestern willow flycatcher, *Empidonax traillii extimus*, Listed Endangered		✓						✓		✓						
Yellow-billed cuckoo, *Coccyzus americanus*, Candidate for Listing		✓					✓	✓	✓	✓	✓			✓		
Whooping crane, *Grus americana*, Listed Endangered			▲		▲	▲						▲			▲	
Black-footed ferret, *Mustela nigripes*, Listed Endangered		✓	✓	✓	✓				✓	✓	✓	✓	✓			
Canada lynx, *Lynx canadensis*, Listed Threatened	✓	✓	✓	✓			✓	✓	✓	✓	✓			✓	✓	
Preble's meadow jumping mouse, *Zapus hudsonius preblei*, Listed Threatened			©									✓				
Arkansas darter, *Etheostoma cragini*, Candidate for Listing				✓	✓								✓			
Bonytail, *Gila elegans*, (presumed-historical) Listed Endangered							©		©		*			*		
Colorado pikeminnow, *Ptychocheilus lucius*, Listed Endangered		*					©	*	©	*	*			*		
Greenback cutthroat trout, *Oncorhynchus clarki stomias*, Listed Threatened	✓		✓												✓	
Humpback chub, *Gila cypha*, Listed Endangered							©		©		*			*		

U. S. Fish and Wildlife Service
Ecological Services
Colorado Field Office

(Effective August 16, 2004)

FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO
1

COUNTIES →	LAKE	LA PLATA	LARIMER	LAS ANIMAS	LINCOLN	LOGAN	MESA	MINERAL	MOFFAT	MONTEZUMA	MONTROSE	MORGAN	OTERO	OURAY	PARK	PHILLIPS
Pallid sturgeon, *Scaphirhynchus albus*, Listed Endangered			▲		▲	▲						▲			▲	
Razorback sucker, *Xyrauchen texanus*, Listed Endangered		*					©	*	©	*	*			*		
Boreal toad, *Bufo boreas boreas*, Candidate for Listing	✓	✓	✓				✓	✓	✓	✓				✓	✓	
Pawneé montane skipper, *Hesperia leonardus montana*, Listed Threatened															✓	
Uncompahgre fritillary butterfly, *Boloria acrocnema*, Listed Endangered	✓	✓						✓						✓	✓	
Clay-loving wild buckwheat, *Eriogonum pelinophilum*, Listed Endangered											✓					
Colorado butterfly plant, *Gaura neomexicana* ssp. *coloradensis*, Listed Threatened			✓													
De Beque phacelia, *Phacelia submutica*, Candidate for Listing							✓									
Knowlton's cactus, *Pediocactus knowltonii*, Listed Endangered		✓														
Mancos milkvetch, *Astragalus humillimus*, Listed Endangered										✓						
Mesa Verde cactus, *Sclerocactus mesae-verdae*, Listed Threatened										✓						
Penland alpine fen mustard, *Eutrema penlandii*, Listed Threatened	✓														✓	
Sleeping Ute milk-vetch, *Astragalus tortipes*, Candidate for Listing										✓						
Slender moonwort, *Botrychium lineare*, Candidate for Listing	✓															
Uinta Basin hookless cactus, *Sclerocactus glaucus*, Listed Threatened							✓				✓					
Ute ladies'-tresses, *Spiranthes diluvialis*, Listed Threatened			✓									✓				

U. S. Fish and Wildlife Service
Ecological Services
Colorado Field Office

(Effective August 16, 2004)

FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO
1

COUNTIES →	PITKIN	PROWERS	PUEBLO	RIO BLANCO	RIO GRANDE	ROUT	SAGUACHE	SAN JUAN	SAN MIGUEL	SEDGWICK	SUMMIT	TELLER	WASHINGTON	WELD	YUMA
Bald eagle, *Haliaeetus leucocephalus*, Listed Threatened	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gunnison sage-grouse, *Centrocercus minimus*, Candidate for Listing	✓				✓		✓		✓						
Least tern (interior population), *Sterna antillarum*, Listed Endangered		✓								✓		▲	▲	▲	
Lesser prairie chicken, *Tympanuchus pallidicinctus*, Candidate for Listing		✓													
Mexican spotted owl, *Strix occidentalis lucida*, Listed Threatened	✓		✓		✓		✓		✓		✓	✓		✓	
Piping plover, *Charadrius melodus*, Listed Threatened		✓								✓		▲	▲	▲	
Southwestern willow flycatcher, *Empidonax traillii extimus*, Listed Endangered					✓		✓	✓	✓						
Whooping crane, *Grus americana*, Listed Endangered										▲		▲	▲	▲	
Yellow-billed cuckoo, *Coccyzus americanus*, Candidate for Listing	✓			✓	✓	✓	✓	✓	✓		✓				
Black-footed ferret, *Mustela nigripes*, Listed Endangered		✓	✓	✓			✓		✓				✓	✓	
Canada lynx, *Lynx canadensis*, Listed Threatened	✓		✓	✓	✓	✓	✓	✓	✓		✓				
Preble's meadow jumping mouse, *Zapus hudsonius preblei*, Listed Threatened												©		✓	
Pawnee montane skipper, *Hesperia leonardus montana*, Listed Threatened												✓			
Uncompahgre fritillary butterfly, *Boloria acrocnema*, Listed Endangered	✓				✓		✓	✓	✓		✓				
Arkansas darter, *Etheostoma cragini*, Candidate for Listing		✓	✓												
Bonytail, *Gila elegans*, (presumed-historical) Listed Endangered	*			*		*	*		*		*				
Colorado pikeminnow, *Ptychocheilus lucius*, Listed Endangered	*			©	*	*	*	*	*		*				

U. S. Fish and Wildlife Service
Ecological Services
Colorado Field Office

(Effective August 16, 2004)

FEDERALLY LISTED AND CANDIDATE SPECIES & THEIR STATUS IN COLORADO
1

COUNTIES →	PITKIN	PROWERS	PUEBLO	RIO BLANCO	RIO GRANDE	ROUTT	SAGUACHE	SAN JUAN	SAN MIGUEL	SEDGWICK	SUMMIT	TELLER	WASHINGTON	WELD	YUMA
Greenback cutthroat trout, *Oncorhynchus clarki stomias*, Listed Threatened			✓												
Humpback Chub, *Gila cypha*, Listed Endangered	*			*		*	*		*		*				
Pallid sturgeon, *Scaphirhynchus albus*, Listed Endangered										▲		▲	▲	▲	
Razorback sucker, *Xyrauchen texanus*, Listed Endangered	*			*	*	*	*	*	*		*				
Boreal toad, *Bufo boreas boreas*, Candidate for Listing	✓			✓	✓	✓	✓	✓	✓		✓				
Colorado bufterfly plant, *Gaura neomexicana* spp. *coloradensis*, Listed Threatened			✓											✓	
Dudley Bluffs (Piceance) twinpod, *Physaria obcordata*, Listed Threatened				✓											
Dudley Bluffs bladderpod, *Lesquerella congesta*, Listed Threatened				✓											
Graham beardtongue, *Penstemon grahamii*, Candidate for Listing				✓											
Penland alpine fen mustard, *Eutrema penlandii*, Listed Threatened											✓				
Ute ladies'-tresses, *Spiranthes diluvialis*, Listed Threatened														✓	
White River beardtongue (penstemon), *Penstemon scariosus* var. *albifluvis*, Candidate for Listing				✓											

TABLE TERMINOLOGY

✓	The check mark indicates that the species is present in that county or that the county is within the historical range of the species
*	Water depletions in the Upper Colorado River and San Juan River basins, in these counties may affect these species
▲	Water depletions in the North or South Platte rivers, in these counties may affect these species
©	The species is present in the county and there is designated critical habitat for the species within the county
Candidate	Means there is sufficient information indicating that formal listing under the ESA may be appropriate
Proposed	Means the species is proposed for possible addition to the Lists of Endangered and Threatened Wildlife and Plants under the ESA
Endangered	Means the species could become extinct
Threatened	Means the species could become endangered

ADDENDUM F-B:

RESULTS OF COLORADO NATURAL HERITAGE
PROGRAM DATABASE SEARCH

Colorado State University

Knowledge to Go Places

Colorado Natural Heritage Program
Colorado State University
8002 Campus Delivery
Fort Collins, Colorado 80523-8002
(970) 491-1309
FAX: (970) 491-3349
www.cnhp.colostate.edu

October 20, 2004

Karyn Coppinger
TRC Solutions
605 Skyline Drive
Laramie, WY 82070

Dear Karyn:

The Colorado Natural Heritage Program (CNHP) is in receipt of your request for information regarding the TRC area of interest in Logan County. In response, I have searched our Biological and Conservation Datasystem (BCD) for natural heritage elements (occurrences of significant natural communities and rare, threatened or endangered plants and animals) documented from the vicinity of the area specified in your request, specifically within the following USGS 7.5' Minute Quadrangles: Peetz and Haystack Butte.

The enclosed report describes natural heritage resources known from this area and gives location (by Township, Range, and Section), precision information, and the date of last observation of the element at that location. This report includes elements known to occur within the specified project site, as well as elements known from similar landscapes near the site. Please note that "precision" reflects the resolution of original data. For example, an herbarium record from "4 miles east of Colorado Springs" provides much less spatial information than a topographic map showing the exact location of the occurrence. "Precision" codes of Seconds, Minutes, and General are defined in the footer of the enclosed report.

The report also outlines the status of known elements. We have included status according to Natural Heritage Program methodology and legal status under state and federal statutes. Natural Heritage ranks are standardized across the Heritage Program network, and are assigned for global and state levels of rarity. They range from "1" for critically imperiled or extremely rare elements, to "5" for those that are demonstrably secure.

You may notice that some occurrences do not have sections listed. Those species have been designated as "sensitive" due to their rarity and threats by human activity. Peregrine falcons, for example, are susceptible to human breeders removing falcon eggs from their nests. For these species, CNHP does not normally provide location information beyond township and range. Please contact us should you require more detailed information for sensitive occurrences.

There are no CNHP designated Potential Conservation Areas located within your project area. In order to successfully protect populations or occurrences, it is necessary to delineate conservation areas. These conservation areas focus on capturing the ecological processes that are necessary to support the continued existence of a particular element of natural heritage significance. Conservation areas may include a single occurrence of a rare element or a suite of rare elements or significant features.

Natural Heritage Program
COLORADO

The goal of the process is to identify a land area that can provide the habitat and ecological processes upon which a particular element or suite of elements depends for their continued existence. The best available knowledge of each species' life history is used in conjunction with information about topographic, geomorphic, and hydrologic features, vegetative cover, as well as current and potential land uses. The proposed boundary does not automatically exclude all activity. It is hypothesized that some activities will cause degradation to the element or the process on which they depend, while others will not. Consideration of specific activities or land use changes proposed within or adjacent to the preliminary conservation planning boundary should be carefully considered and evaluated for their consequences to the element on which the conservation unit is based.

The Colorado Division of Wildlife has legal authority over wildlife in the state. CDOW would therefore be responsible for the evaluation of and final decisions regarding any potential effects a proposed project may have on wildlife. If you would like more specific information regarding these or other vertebrate species in the vicinity of the area of interest, please contact the Colorado Division of Wildlife.

The information contained herein represents the results of a search of Colorado Natural Heritage Program's (CNHP) Biological and Conservation Data System (BCD), and can be used as notice to anticipate possible impacts or identify areas of interest. Care should be taken in interpreting these data. Sensitive elements are currently known from within the proposed project area, and additional, but undocumented, elements may also exist (see enclosed report). Please note that the absence of data for a particular area, species, or habitat does not necessarily mean that these natural heritage resources do not occur on or adjacent to the project site, rather that our files do not currently contain information to document their presence. CNHP information should not replace field studies necessary for more localized planning efforts, especially if impacts to wildlife habitat are possible.

Although every attempt is made to provide the most current and precise information possible, please be aware that some of our sources provide a higher level of accuracy than others, and some interpretation may be required. CNHP's data system is constantly updated and revised. Please contact CNHP for an update or assistance with interpretation of this natural heritage information.

Sincerely,

Michael Menefee
Environmental Review Coordinator

Enc.

Natural Heritage Program
COLORADO

Colorado Natural Heritage Program Environmental Review

Locations and Status of Rare and/or Imperiled Species and Natural Communities known from or likely to occur within the following USGS 7.5' Minute Quadrangles: Peetz & Haystack Butte in Logan County, Colorado

Report generated: 20 October 2004

EO_ID	major group	scientific name	common name	prec	last obs	trs	grank	srank	eorank	ESA	fed stat	st stat
12,022	Birds	*Calcarius mccownii*	Mccown's Longspur	S	2002-06-29	011N051W 18; 011N052W 13;	G4	S2B	E		USFS	

precision codes: S = "seconds", location known within 100m; M = "minutes", location known within 1 mile; G = "general", location known within 5 miles

ADDENDUM F-C:

WESTERN'S DETERMINATION OF EFFECT AND REQUEST
FOR CONSULTATION FOR ENDANGERED, THREATENED, PROPOSED,
AND CANDIDATE SPECIES FOR THE SPRING CANYON WIND PROJECT

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

MAY 18 2005

CERTIFIED MAIL - RETURN RECEIPT REQUESTED – 7000 1530 0004 1317 6462

Ms. Susan Linner
Colorado Field Supervisor
Ecological Services
U.S. Fish and Wildlife Service
755 Parfet Street, Suite 361
Lakewood, CO 80215

SUBJECT: Determination of Affect and Request for Consultation for Endangered, Threatened, Proposed, and Candidate Species for the Spring Canyon Wind Project

Dear Ms. Linner:

The Western Area Power Administration (Western), an agency of the U.S. Department of Energy (DOE), is the lead Federal agency for a project to interconnect a 130-MW wind project to Western's existing 230-kV Sidney to North Yuma Transmission Line. Spring Canyon Energy LLC (SCE) a wholly-owned affiliate of Invenergy, LLC, has applied to Western to interconnect a proposed 130-MW wind power facility to Western's existing 230-kV Sidney to North Yuma Transmission Line. The Spring Canyon Wind Project would be constructed entirely on private land located east of the town of Peetz, in Logan County, Colorado. SCE has obtained or will obtain easements from the private landowners to construct and operate the wind farm. The wind farm would consist of approximately 87 1.5-MW or 72 1.8-MW wind turbines and associated facilities. The wind turbine generators would be supported by tubular towers. Support facilities would include step-up transformers, an electrical substation, underground and overhead power collection and communication lines, roads, and an operation and maintenance facility.

A list of Federally listed threatened and endangered species, those proposed for listing, and candidates potentially occurring in the project area, was developed using the *Federally Listed and Candidate Species List for Colorado by County: Logan County* (August 16, 2004) that was provided by the Colorado Field Office of the U.S. Fish and Wildlife Service (USFWS). The USFWS, in response to a request letter dated October 28, 2004, indicated that the following threatened, endangered and candidate species may occur with the project area:

Bald eagle (*Haliaeetus leucocephalis*)
Whooping crane (*Grus americana*)
Piping plover (*Charadrius melodus*)

Interior least tern (*Sterna antillarum*)
Pallid sturgeon (*Scaphirhynchus albus*)

A Biological Assessment (BA) was prepared for the project to address potential impacts to threatened and endangered species. Appendix F of the enclosed pre-approval Environmental Assessment contains the BA.

Based on the analysis contained in the BA, Western has determined that the project may affect, but is not likely to adversely affect, bald eagles in Colorado.

The whooping crane, piping plover, and interior least tern may occur within the project area and potential for impacts would be similar to those described for bald eagles. However, these species and the pallid sturgeon are of concern primarily due to potential for water depletions from the South Platte River. During construction of the 130-MW wind project, an estimated 1,526,335 gallons (4.7 acre-ft) of water would be consumed. During the 39-year operational life-of-project, an additional 1,272,375 gallons (3.9 acre-ft) would be consumed. Total water usage over the life-of-project would be 2,798,710 gallons, so over a 40-year life-of-project, an average of 69,968 gallons (0.2acre-ft) per year would be consumed.

In 2002, the Fish Wildlife Service (FWS) prepared a biological opinion in its *Revised Intra-Service Section 7 Consultation for Federal Agency Actions Resulting in Minor Water Depletions to the Platte River System* (FWS 2002). The biological opinion covers any Federal actions other than wetland restoration projects that result in average annual depletions of 25 acre-ft or less to the Platte River system, regardless of location within the basin. The effects analysis and conservation measures apply only to federally listed species, designated whooping crane habitat, and proposed critical habitat for the piping plover along the Platte River in Nebraska.

In accordance with the above-referenced biological opinion, "Federal agencies should continue to conclude that each action resulting in a depletion of 25-acre feet or less per year to the Platte River system may adversely affect the whooping crane, interior least tern, piping plover, and/or pallid sturgeon, designated whooping crane critical habitat, and proposed piping plover critical habitat" (FWS 2002). Since the Spring Canyon wind project would result in a depletion of less than 25-acre ft/year, Western has determined that the project may adversely affect these species and critical habitats. Western hereby requests consultation with the FWS and requests the FWS to debit the Fish and Wildlife Foundation account to off-set project impacts on downstream Platte River species.

If you are in agreement with our determinations, we would appreciate a letter of concurrence from the USFWS. If you have any questions or comments regarding this project, please telephone Rodney Jones at (970) 461-7371. Thank you for your assistance and cooperation this project.

Sincerely,

Joel K. Bladow
Regional Manager

Enclosure

cc:

Mr. Bruce McCloskey
Director
Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216

Ms. Kirstie M. Bay
Colorado Division of Wildlife
Wildlife Conservation Biologist-NE Colorado
122 East Edison Street
Brush, CO 80723
(enclosure sent under separate cover)

bcc:

Mr. Joel Schroeder
Invenergy L.L.C.
1 South Wacker, Suite 2020
Chicago, IL 60606

Ms. Laryn Coppeinger
TRC Mariah Associates, Inc.
605 Skyline Drive
Laramie, WY 82070

D. Swanson, A7400, Lakewood, CO
M.Barger, A7400, Lakewood, CO
J. Bridges, A7400, Lakewood, CO
J0400
J0420
J5000
J5640
(w/out copy of enclosure)

ADDENDUM F-D:

BIOLOGICAL OPINION FOR THE SPRING CANYON WIND PROJECT, LOGAN COUNTY, COLORADO, ES/CO: SPLATTE/MINOR DEPLETIONS, MAIL STOP 65412, ES/CO: ES/LK-6-CO-05-4-012, DATED JUNE 7, 2005

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: SPlatte/Minor Depletions
Mail Stop 65412
ES/CO: ES/LK-6-CO-05-F-012

JUN - 7 2005

Mr. Joel K. Bladow
Department of Energy
Western Area Power Administration
Rocky Mountain Service Region
P.O. Box 3700
Littleton, Colorado 80218-6901

RE: Biological Opinion for the Spring Canyon Wind Project, Logan County, Colorado (DOE/EA-1521)

Dear Mr. Bladow:

In accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.) and the Interagency Cooperation Regulations (50 CFR 402), the U.S. Fish and Wildlife Service (Service) has reviewed your May 17, 2005, letter and Environmental Assessment/Biological Assessment (EA/BA) regarding impacts of the proposed wind project on federally listed species and designated critical habitat.

Spring Canyon Energy LLC (SCE), a wholly owned affiliate of Invenergy, LLC, has applied to the Western Area Power Administration (Western) to interconnect a proposed 130-MW wind power facility to Western's existing 230-kV Sidney to North Yuma Transmission Line. The proposed wind project would be constructed entirely on private land located east of the town of Peetz. SCE has obtained or would obtain easements from the private landowners to construct and operate the wind farm. The proposed wind farm would consist of approximately 87 1.5-MW or 72 1.8-MW wind turbines and associated facilities. The wind turbine generators would be supported by tubular towers. Support facilities would include step-up transformers, an electrical substation, underground and overhead power collection and communication lines, roads, and an operation and maintenance facility. During construction of the proposed 130-MW wind project, an estimated 1,526,335 gallons or 4.7 acre-feet (af) of water would be consumed. According to Western's calculations for total water usage over a 40-year life-of-project, the proposed project would result in minor water depletions to the Platte River system of **0.21 af/year**. For purposes of calculating depletion charges, the Service has classified this as an existing project.

Western has determined that the water depletion associated with the proposed action *may affect and is likely to adversely affect* the federally-listed whooping crane (*Grus americana*), the interior least tern (*Sterna antillarum*), the piping plover (*Charadrius melodus*) and the pallid sturgeon (*Scaphirhynchus albus)* and may have an impact on designated critical habitat associated with the Platte River in Nebraska. Western determined that the proposed project *may affect but is not likely to adversely affect* bald eagles (*Haliaeeteus leucocephalus*) in Colorado. Western also determined that no other threatened or endangered species, either currently listed or proposed for listing, nor designated or proposed critical habitat will be affected by this project.

Since 1978, the Service has consistently taken the position in its section 7 consultations that Federal agency actions resulting in water depletions to the Platte River system are likely to jeopardize the continued existence of one or more federally-listed threatened or endangered species and adversely modify or destroy designated and proposed critical habitat. During the course of informal consultations with a number of Federal agencies, the Service learned that there are over 1,000 proposed projects which will deplete water from the Platte River system and require formal section 7 consultation. It was also determined that the vast majority of these projects would likely result in individual depletions of 25 af or less per year. To effectively deal with such an anticipated large workload, it was necessary for the Service to develop a streamlined approach which meets the requirements of section 7 for offsetting the adverse effects of each Federal agency action resulting in a minor water depletion.

An intra-Service section 7 consultation was conducted in coordination with those Federal agencies whose actions may result in minor water depletions of 25 af or less per year to the Platte River system. This led to the issuance of a biological opinion by the Service on June 13, 1996, which provides reasonable and prudent alternatives to avoid the likelihood of jeopardy to federally-listed species and adverse modification or destruction of designated critical habitat occurring along the Platte River. A revision of the 1996 biological opinion made a no jeopardy determination contingent upon the implementation of conservation measures (formerly reasonable and prudent alternatives in the 1996 biological opinion) by the Federal agencies. To satisfy the requirements of the ESA, Federal action agencies and project proponents (i.e., Federal and non-Federal) are provided conservation measures described in the 2002 revised biological opinion furnished to your agency. Consequently, the Service concurs with your determination that the proposed wind project is likely to adversely affect the federally-listed whooping crane, interior least tern, piping plover, pallid sturgeon, designated whooping crane critical habitat, and piping plover critical habitat. The Service also concurs with your determination that bald eagles are not likely to be adversely affected by the proposed project.

It is our understanding that you would like to take advantage of the conservation measure authorizing the use of funds in a National Fish and Wildlife Foundation account to offset the project-related impacts to Platte River fish and wildlife resources. Therefore, it has been calculated that **$6.97** will be debited from the Foundation account to use in restoring Platte River habitat as described in the revised biological opinion.

The Service hereby agrees that the process described above will serve to offset the project-related impacts and avoid the likelihood of adverse effects to federally-listed species and their designated critical habitat. Any need for reinitiation of formal consultation on this proposed action is outlined in the CONCLUSION section of the revised biological opinion.

Section 9 of the ESA, as amended, prohibits taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish and wildlife without a special exemption. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the Agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of an incidental take statement. The Service does not anticipate that the proposed action will result in any incidental take of any threatened or endangered species. Therefore, no incidental take is authorized.

The Bald and Golden Eagle Protection Act of 1940 (BGEPA), as amended (16 U.S.C. 668 et. seq.) and the Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. 703 et. seq.) are also potentially applicable for wind projects involving transmission lines such as the proposed project. The project EA/BA described measures to avoid impacts to eagles, other raptors, and migratory birds including adherence to the *Interim Guidance on Avoiding and Minimizing*

Impacts to Wildlife from Wind Turbines, which the Service released in 2003, and the *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996*, which the Edison Electric Institute published. In addition, the applicant would conduct pre-construction surveys for nesting birds within suitable habitat in the project area and time construction to avoid activities within appropriate buffer zone(s) of any active nests until after the young have fledged.

Efforts to identify and avoid nesting birds, nests, and their young do not assure that project operations, as enabled by Western's execution of the interconnect agreement, will not result in adverse effects to eagles and other migratory birds. Although absolution from liability under the ESA, BGEPA, and MBTA is not possible, the Service Division of Law Enforcement and the Department of Justice have used enforcement and prosecutorial discretion when companies/ individuals have made efforts to avoid the unauthorized take of eagles and other migratory birds.

We appreciate the efforts made to date to resolve the issues of Platte River depletive effects to listed species and potential project impacts to raptors and other migratory birds. If the Service can be of further assistance, please contact Sandy Vana-Miller in this office by calling (303) 275-2370.

Sincerely,

Susan C. Linner
Colorado Field Supervisor

cc: FWSR6, B. Dach, J. McKee
FWSR6/ES/GJ, E. Mayo
FWSR6/ES/LK, S. Vana-Miller
CDOW, Kirstie Bay
Fish & Wildlife Foundation, Rebecca Kramer

APPENDIX G:

SCOPING LETTERS DATED
JANUARY 6, 2005, AND JANUARY 10, 2005

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

January 6, 2005

Name
Company
Address (See Attached List)
City, ST Zip

Dear _____:

Western Area Power Administration (Western), a power marketing agency within the U.S. Department of Energy, is preparing to evaluate a request for interconnection of a proposed 129-megawatt (MW) wind power generation project in northeast Colorado. The purpose of this letter is to inform you of our upcoming environmental review process and to share and solicit information regarding cultural and environmental resources associated with the proposed project that may be of interest and importance to your Tribe.

Briefly, Invenergy Wind Power, LLC (Invenergy), a wholly-owned affiliate of Invenergy, LLC, has applied to Western to interconnect a proposed 129-megawatt (MW) wind power facility to Western's existing 230-kilovolt (kV) North Yuma to Sidney Transmission Line. With a capacity factor of approximately 38%, estimated average output from the wind farm would be 49 MW. The Peetz Table Wind Project (Peetz Table) would be constructed entirely on private land located east of the town of Peetz, in Logan County, Colorado (Map 1). The wind farm would consist of approximately 86 1.5-MW wind turbines and associated facilities. The wind turbine generators would be supported by tubular towers. Support facilities would include step-up transformers; a substation; underground and overhead power collection and communication lines; roads; and an operation and maintenance facility.

Western will assume the role of lead Federal agency for the preparation of the environmental assessment (EA) for the proposed project. Invenergy has acquired the services of TRC, an environmental contractor from Laramie, Wyoming, to conduct studies and evaluate the natural, human, and cultural resources that could potentially be affected by the proposed project. Specifically, TRC will prepare a biological assessment for the proposed action, conduct Class I and Class III cultural resource inventories, and prepare a stand-alone Class III cultural resource inventory report. The results of the studies, inventories, and evaluations will assist in the planning for the construction of the proposed project. TRC will also prepare the EA for Western's review.

At this time, we would like to hear from you concerning any interests or issues your Tribe would like to discuss concerning this wind energy project and the proposed environmental review. We would also appreciate receiving any information that you would be willing to share with us on any unique, special, ethnographic, or archaeological resources or areas in or near the project area. If you are aware of any other Tribes, individuals, or tribally affiliated organizations that should be contacted, please let us know. A listing of other Tribes and individuals receiving this letter is enclosed. Upon request, we will be happy to provide you a copy of the pre-approval EA and/or the cultural resources inventory report as soon as they are available. We expect to have copies of the pre-approval EA and the cultural resources inventory report available for review in February 2005.

If you would like a copy of the pre-approval EA, the cultural resources inventory report, or have specific issues or concerns, please contact:

Mr. Rodney Jones
Environmental Specialist
Western Area Power Administration
Rocky Mountain Region
5555 E. Crossroads Boulevard
Loveland, Colorado 80539-3003
rjones@wapa.gov

You may also contact any of the following individuals to obtain or provide information, or inquire on the schedule and scope of the upcoming field surveys.

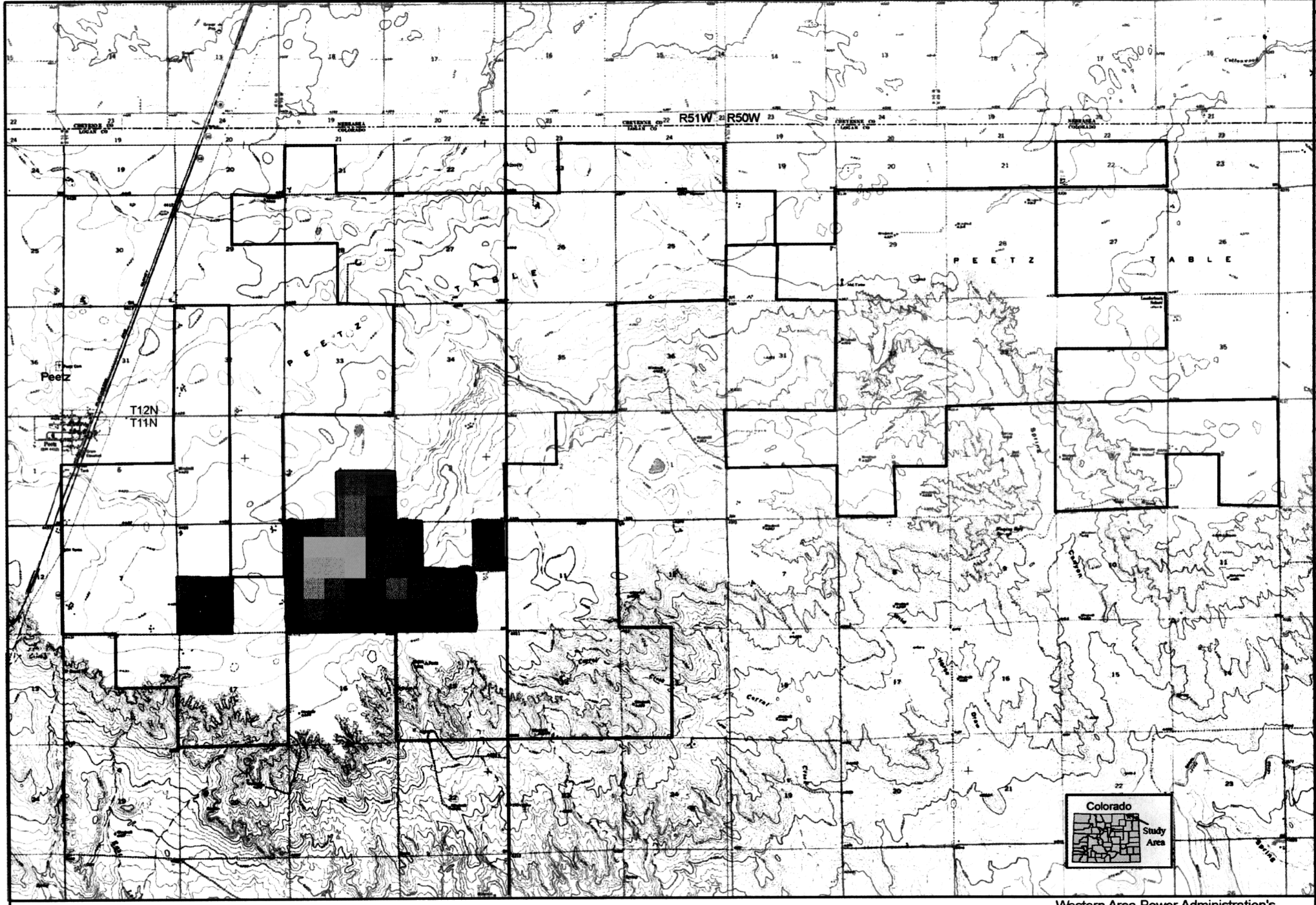
Mr. Rodney Jones	Environmental Specialist	970-461-7371
Ms. Mary Barger	Western's Federal Preservation Officer	720-962-7253
Mr. David Vader	Western's Native American Liaison	720-962-7256

We look forward to hearing from you.

Sincerely,

Joel K. Bladow
Regional Manager

Enclosures



Location of Peetz Table Wind Project

Scale: 1 inch equals 1.082 miles

Location: 040° 57' 34.1" N 103° 00' 41.0" W

Western Area Power Administration's,
N. Yuma-Sidney 230-kV Transmission Line
Project area
Not included in project area

Mr. Eugene Little Coyote
President
Northern Cheyenne Tribal Council
P.O. Box 128
Lame Deer, MT 59043

Mr. Gilbert Brady
Tribal Historic Preservation Officer
Northern Cheyenne Tribe
P.O. Box 128
Lame Deer, MT 59043

Mr. Richard Brannan
Chairman
Arapaho Business Council
Northern Arapaho Tribe
P.O. Box 396
Fort Washakie, WY 82514

Mr. Robert Goggles
NAGPRA Representative
Northern Arapaho Tribe
P.O. Box 396
Fort Washakie, WY 82514

Mr. Billy Evans Horse
Chairman
Kiowa Tribe of Oklahoma
P.O. Box 369
Carnegie, OK 73015

Mr. George Daingkau
NAGPRA Representative
Kiowa Tribe of Oklahoma
118 N. Stephens
Hobart, OK 73651

Ms. Cecilia Fire Thunder
President
Oglala Sioux Tribal Council
P.O. Box 2070
Pine Ridge, SD 57770

Mr. Alex White Plume
Vice President
Oglala Lakota Tribe
P.O. Box H
Pine Ridge, SD 57770

Mr. George E. Howell
President
Pawnee Tribe of Oklahoma
P.O. Box 470
Pawnee, OK 74058

Mr. Francis Morris
Director, Tribal Historical Preservation and
Repatriation Office
Pawnee Tribe of Oklahoma
P.O. Box 470
Pawnee, OK 74058

Mr. William Blind
Interim Chairman
Cheyenne-Arapaho Tribe of Oklahoma
P.O. Box 38
Concho, OK 73022

Mr. Gordon Yellowman
NAGPRA Historic Preservation
Representative
Cheyenne-Arapaho Tribe of Oklahoma
P.O. Box 38
Concho, OK 73022

Mr. William Lee Pedro, Jr.
Southern Arapaho Historic Preservation &
Sand Creek Representative
Southern Arapaho of Oklahoma
P.O. Box 41
Concho, OK 73022

Mr. Wallace Coffee
Chairman
Comanche Tribe of Oklahoma
HC 32-Box 1720
Lawton, OK 73502

Ms. Donna Sovo
Acting THPO/NAGPRA/OEP Director
Comanche Tribe of Oklahoma
P.O. Box 908
Lawton, OK 73502

Mr. Charles Colombe
President
Rosebud Sioux Tribal Council
P.O. Box 430
Rosebud, SD 57570

Mr. Terry Gray
Archivist, RST SCRM/NAGPRA
Rosebud Sioux Tribe
SGU Heritage Center
P.O. Box 675
Mission, SD 57555

Ms. Elaine Quiver
Grey Eagle Society
Oglala Lakota Tribe
P.O. Box 550
Pine Ridge, SD 57770

Mr. Francis Brown
Chairman
Medicine Wheel Coalition for
Sacred Sites in North America
P.O. Box 2378
Rancho de Taos, NM 87557

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

January 10, 2005

Name
Company
Address (See Attached List)
City, ST Zip

Dear _____

Western Area Power Administration (Western), a power marketing agency within the U.S. Department of Energy, is preparing to evaluate a request for interconnection of a proposed 129-megawatt (MW) wind power generation project in northeast Colorado. The purpose of this letter is to inform you of our upcoming environmental review process and to share and solicit information regarding cultural and environmental resources associated with the proposed project that may be of interest and importance to you.

Briefly, Invenergy Wind Power, LLC (Invenergy), a wholly-owned affiliate of Invenergy, LLC, has applied to Western to interconnect a proposed 129-megawatt (MW) wind power facility to Western's existing 230-kilovolt (kV) North Yuma to Sidney Transmission Line. With a capacity factor of approximately 38%, estimated average output from the wind farm would be 49 MW. The Peetz Table Wind Project (Peetz Table) would be constructed entirely on private land located east of the town of Peetz, in Logan County, Colorado (Map 1). The wind farm would consist of approximately 86 1.5-MW wind turbines and associated facilities. The wind turbine generators would be supported by tubular towers. Support facilities would include step-up transformers; a substation; underground and overhead power collection and communication lines; roads; and an operation and maintenance facility.

Western will assume the role of lead Federal agency for the preparation of the environmental assessment (EA) for the proposed project. Invenergy has acquired the services of TRC, an environmental contractor from Laramie, Wyoming, to conduct studies and evaluate the natural, human, and cultural resources that could potentially be affected by the proposed project. Specifically, TRC will prepare a biological assessment for the proposed action, conduct Class I and Class III cultural resource inventories, and prepare a stand-alone Class III cultural resource inventory report. The results of the studies, inventories, and evaluations will assist in the planning for the construction of the proposed project. TRC will also prepare the EA for Western's review.

At this time, we would like to hear from you concerning any interests or issues you would like to discuss concerning this wind energy project and the proposed environmental review. We would appreciate receiving your input by January 21, 2005. Western will make a pre-approval EA available to the State of Colorado and Native American Tribes, and on request, to members of the public for pre-approval review.

If you would like a copy of the pre-approval EA or have specific issues or concerns you would like to submit to Western, please contact:

Mr. Rodney Jones
Environmental Specialist
Western Area Power Administration
Rocky Mountain Region
5555 E. Crossroads Boulevard
Loveland, Colorado 80539-3003

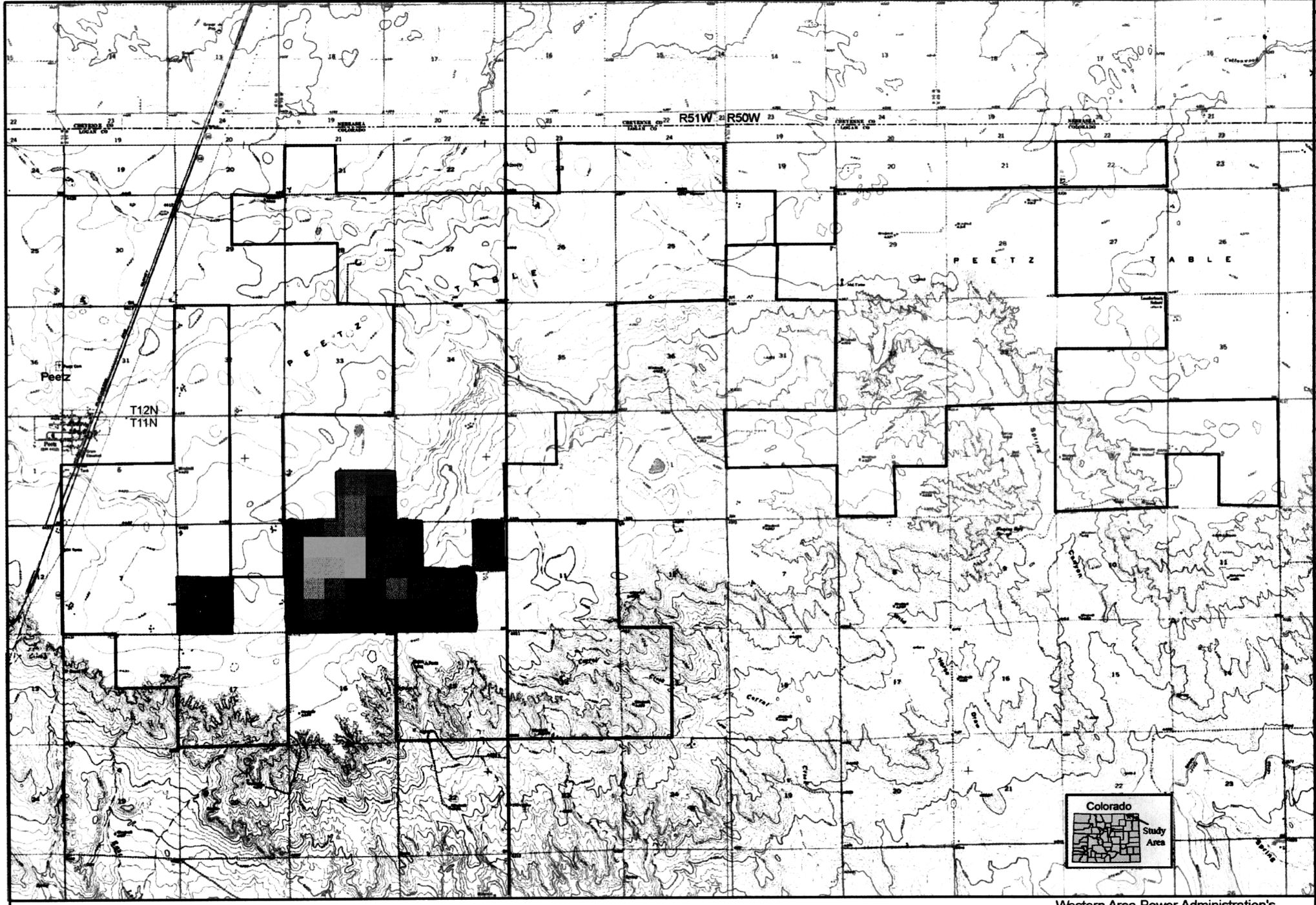
or, you may email them to: rjones@wapa.gov

Thank you for you assistance and participation. We look forward to hearing from you.

Sincerely,

Joel K. Bladow
Regional Manager

Enclosure



Location of Peetz Table Wind Project

Scale: 1 inch equals 1.082 miles

Location: 040° 57' 34.1" N 103° 00' 41.0" W

Western Area Power Administration's,
N. Yuma-Sidney 230-kV Transmission Line
Project area
Not included in project area

PEETZ TABLE WIND PROJECT
COLORADO AGENCIES

Mr. Leroy Hall
Natural Resource Conservation Service
Greeley Area Office
4407 29th Street, Ste. 300
Greeley, CO 80634-8703

Mr. Don Ament
Commissioner
Colorado Department of Agriculture
700 Kipling Street, Ste. 4000
Lakewood, CO 80215-8000

Mr. Bruce McCloskey
Director
Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216

Ms. Karla Harding
Regional Director
Colorado Department of Transportation
1420 2nd Street
Greeley, CO 80632

Ms. Georgianna Contiguglia
State Historic Preservation Office
Colorado Historic Society
1300 Broadway
Denver, CO 80203

Mr. Hal D. Simpson, P.E.
State Engineer
Colorado State Engineer's Office
1313 Sherman Street, Rm. 818
Denver, CO 80203

PEETZ TABLE WIND PROJECT Names
provided from TRC

Roger Adams
P.O. Box 146
Peetz, CO 80747

Gerald Berlage
1406 24th Ave.
Sidney, NE 69162

Deon Crow
212 2nd Ave.
Crook, CO 80726

Roy & Shirley Crow
33569 CR 77
Crook, CO 80726

David & Marsha Davis
19973 CR 74
Peetz, CO 80747

Dorys Fehringer
37127 CR 49, # 6
Peetz, CO 80747

Frank & Faye Fehringer
24753 CR 70, # 68
Peetz, CO 80747

Ken & Judy Fehringer
37127 CR 49, # 6
Peetz, CO 80747

Charles & Lajean Fehringer
36515 CR 43, #53
Peetz, CO 80747

Robert Fischer
916 Olsen Drive
Sidney, NE 69162

Gary & Marlene Gentry
HC 75, # A-7
Peetz, CO 80747

Dean Gillham Family Trust
c/o Richard Gillham
34266 Hwy 113
Peetz, CO 80747

Gary & Patti Gillham
23121 CR 74
Peetz, CO 80747

Ivan & Ardith Gillham
605 North Street, Box 12
Peetz, CO 80747

Robert Gillham
23111 CR 74
Peetz, CO 80747

Byron & Lori Gillham
34088 CR 57, # 75
Peetz, CO 80747

Dean Hecker
37485 CR 63, # 81
Peetz, CO 80747

Sally Johnson
3555 Moore Street
Wheatridge, CO 80033

Douglas Kent
P.O. Box 1828
Scotts Bluff, NE 69361

Dean & Jacque Koester
35484 CR 53, # 73
Peetz, CO 80747

Ed Koester
36806 CR 69, # A-9
Peetz, CO 80747

Robert Lafler
278 Road 113
Sidney, NE 69162

Julia Lawrence
42356 Road 56
Reedley, CA 93654

Steven Mahr
10905 Road 6
Sidney, NE 69162

J. H. McNish
320 Homestead Drive
Lawrence, KS 66049

Susan Morris
127 B Street, Rt 2
Lewistown, MT 59457

James Mueller
42985 SD Highway 52
Yankton, SD 57078

Colburn Nelson
11783 US Hwy 30
Sidney, NE 69162

Jack & Carole Nienhuser
35230 CR 69, # A-6
Peetz, CO 80747

Dwayne D. Phelps
c/o Gary Phelps
36549 CR 69, # A8
Peetz, CO 80747

Jimmie Phelps
685 NE Hwy 19
Lorenzo, NE 69162

Jay Reker
38078 CR 67, # A2
Peetz, CO 80747

Twane & Donna Reker
38078 CR 67, # A2
Peetz, CO 80747

Barry Reker
38078 CR 67, # A2
Peetz, CO 80747

Carl Roelle
HC 75, # 84
Peetz, CO 80747

Coletta Roelle
P.O. Box 102
Peetz, CO 80747

David & Marsha Ross
5767 CR 78
Peetz, CO 80747

Walter & Marcella Schumacher
421 VanValkenburg Ave. Box 195
Peetz, CO 80747

Gary Schumacher
34775 CR 75, # 74
Peetz, CO 80747

Jeff Schumacher
831 Park Street
Sterling, CO 80751

Lyle & Karen Schumacher
36242 CR 51
Peetz, CO 80747

Phil Schumacher
P.O. Box 56
Peetz, CO 80747

Floyd Shepherd
37820 CR 69
Peetz, CO 80747

Herman Sommerfeld
30271 CR 58
Iliff, CO 80736

Lee & Janice Walz
P.O. Box 174
Peetz, CO 80747

Ralph Whitman
34414 CR 53, # 72
Peetz, CO 80747

Robert Witters
2037 Crestvue Circle
Golden, CO 80401

Susan Linner, Colorado Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, CO 80215

Kirstie M. Bay
Colorado Division of Wildlife
Habitat Biologist – Area 3
122 E. Edison
Brush, CO 80723

Gene Meisner
Court House
Sterling, CO 80751

Greg Etl
Court House
Sterling, CO 80751

Julie Lively
Court House
Sterling, CO 80751

Mark Fuller
416 Walnut Street
Sterling, CO 80751

Jerry Haynes
322 North 10th Avenue
Sterling, CO 80751

Dustin McCormick
Planning & Building Coordinator
315 Main Street
Suite 2
Sterling, CO 80751

Jack McLavey
Court House
Sterling, CO 80751

Byron Hickox
Logan County Planner
315 Main Street
Suite 2
Sterling, CO 80751

Frank Gower
221 Villa Vista Street
Sterling, CO 80751

Lee Roth
704 Elwood Street
Sterling, CO 80751

Jennifer Crow
Court House
Sterling, CO 80751

Dan Jones
510 Glenora Street
Sterling, CO 80751

Mark Pevler
714 Jackson Street
Sterling, CO 80751

Larry Fetzer
211 Main Street
Sterling, CO 80751

APPENDIX H:

SHPO CONSULTATION AND CONCURRENCE LETTERS

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

MAY 11 2005

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

Dear Ms. Contiguglia:

Western Area Power Administration (Western) is proposing to execute an interconnect agreement with Spring Canyon Energy (SCE) for a 130 MW wind project located in Logan County, Utah (see Figure 1.1 in the enclosed report). The project would be constructed in phases, beginning with a 60-MW phase to be constructed in 2005, pending successful completion of the environmental review process.

In consideration of the effect of the undertaking on cultural resources as per 36 CFR 800.5, a cultural resource survey of the area to be disturbed by Phase I construction was conducted by TRC Mariah Associates Inc. The survey entitled "*Class III Cultural Resource Inventory, Spring Canyon Wind Project, Logan County, Colorado, formerly known as The Peetz Table Wind Project*" is enclosed for your review. A total of 6,424 acres of private land was surveyed. The survey identified 23 historic and prehistoric sites and 43 isolated artifacts.

Based on the cultural resource report, Western has made a determination of **no historic properties affected** by the proposed project as outlined in 36 CFR 800.4, subsection (d)(1). The submission of this documentation fulfills Western's responsibilities under Section 106 of the National Historic Preservation Act, as amended.

I. Description of the Undertaking - Western is proposing execute an interconnect agreement with SCE. As proposed, SCE would construct and operate a 130-MW wind energy facility on privately-owned land on Peetz Table east of Peetz in Logan County, Colorado. The project would connect the wind farm to Western's existing Sidney to North Yuma 230-kV transmission line. The wind farm would consist of approximately 87 1.5-MW or 72 1.8-MW wind turbines and associated facilities. The wind turbine generators would be supported by 260 feet (80 meters) tall tubular towers. Support facilities would include step-up transformers; a substation; underground and overhead power collection and communication lines; access roads; and an operations and maintenance building. Access to the project area would be via Colorado Highway 113 and a network of existing county roads within the project area. Access to wind farm facilities, including individual turbines, would be provided by new access roads to be constructed for the purposes of wind farm construction and operation.

II. Methodology and Reporting - A Class I literature review was conducted at the Colorado Historical Society on October 14, 2004, and on March 29, 2005. The results of the review indicated that three previous survey projects have been completed within the project area and four sites have been recorded (see Section 4 in the enclosed report). An intensive field examination of the Phase I construction area was also conducted, beginning on February 19, 2005.

III. Resources Located, Identified, and Evaluated - The Class III survey of the project area resulted in the documentation of 23 new historic and prehistoric sites and 43 isolated artifacts.

Site 5LO484: Site 5LO484 is a deflated hearth exposed in a two-track road. It is located at the southern edge of Peetz Table roughly 640 feet (200 meters) north of a deep, south-trending drainage valley at an elevation of 4,435 feet (1,352 meters). The hearth remnant is limited to a completely deflated cluster of roughly 25 heat-reddened granite and quartzite cobbles in a 50-centimeters diameter area within the rut of a two-track road. No associated staining or artifacts are present, and a single auger test excavated just southwest of the hearth recovered no evidence of buried cultural material in 20 centimeters of deflated sandy loam and gravels overlying residual sediments. Site 5LO484 is recommended as not eligible for listing on the National Register of Historic Places (NRHP). It is limited to a single deflated hearth remnant of indeterminate age with no associated artifacts, and it occurs in an area lacking the potential for significant intact buried cultural deposits. Overall, the site lacks data that could provide significant information or insights concerning site activities, site functions, subsistence or settlement patterns, or other topics of research interest.

Site 5LO485: Site 5LO485 is a prehistoric open camp located on a south-trending ridge spur that protrudes from the southern escarpment of Peetz Table. The ridge is flanked by ephemeral streams that drain the area south into the South Platte River Valley. The site lies at an elevation of 4,448 feet (1,356 meters) and commands a good view of the surrounding terrain. The site consists of 12 scattered pieces of lithic debitage, approximately 10 scattered heat-altered quartzite fragments, two utilized flakes, one biface, and one tested cobble. Site 5LO485 is recommended as not eligible for listing on the NRHP.

Site 5LO486: Site 5LO486 consists of the sparse remains of a historic homestead. It is located on a broad plain just north of the southern escarpment of Peetz Table at an elevation of 4,435 feet (1,352 meters). There is no plotted information shown on the 1881 Government Land Office (GLO) plat map for T11N, R51W. According to the Master Title Plat and historical indices, Ward S. Davis filed for and received a homestead entry patent (HE 798414) for 164.47 acres on March 3, 1921. The patent was issued to Davis by the Sterling Land Office of the GLO under the original Homestead Entry law of May 20, 1862. The entry has not been cancelled (Bureau of Land Management (BLM) n.d.). The site consists of an open poured-concrete basement, two broken concrete foundation pads, and a historic debris scatter. The historic debris scatter consists of approximately 40 glass fragments, two stoneware fragments, one white earthenware ceramic fragment, 23 concrete fragments, and four red bricks. There are 10 tin cans, several metal straps, sheet metal, wire, unknown metal fragments, a railroad tie plate, kitchen utensils, pot lids, and several miscellaneous metal tubes and unidentifiable fragments. Site 5LO486 is recommended as not eligible for nomination to the NRHP.

Site 5LO487: Site 5LO487 consists of a combined historic and modern trash scatter. It is located at the head of a drainage cut on the southern escarpment of Peetz Table at an elevation of 4,445 feet (1,355 meters). There is no plotted information shown on the 1881 GLO plat map for T11N, R51W. According to the Master Title Plat and historical indices, Joel A. L. Meyer filed for and received a homestead entry patent (HE 479551) for 329.33 acres on June 22, 1915. The patent was issued to Meyer by the Sterling Land Office of the GLO under the original Homestead Entry law of May 20, 1862. The entry has not been cancelled (BLM n.d.). No evidence of a homestead complex was found during the inventory. The historic artifact assemblage present on the site consists of scattered solder-dot cans, nine amethyst glass fragments, and a 1941 Colorado license plate. Modern debris present includes a Clorox bottle, one stove part, miscellaneous car parts, and 30- and 50-gallon barrels. The amethyst glass fragments are contemporary with the patent date. The technique of using manganese in the manufacturing process lasted until approximately 1917. Site 5LO487 is recommended as not eligible for listing on the NRHP.

Site 5LO488: Site 5LO488 is a historic artifact scatter located in a nearly level plowed wheatgrass field. The site is on a broad upland plain at an elevation of 4,315 feet (1,315 meters). It lies about 1,000 feet (305 meters) east of an ephemeral tributary of Spring Canyon and about 0.5 mile (0.8 kilometer) north of the southern edge of Peetz Table. A review of the GLO plat maps for 1881 and the Master Title Plat provided no information as to the origin of the site (BLM n.d.). The site consists of a large number of glass and ceramic fragments, a variety of metal fragments, two nails, eight bricks, one spoon, one wrench, one spark plug, and a ceramic furniture caster. Site 5LO488 is recommended as not eligible for listing on the NRHP.

Site 5LO489: Site 5LO489 is a historic trash dump located at the head of a prominent ephemeral drainage that flows south into the South Platte River Valley from the southern escarpment of Peetz Table. Elevation at the site is 4,437 feet (1,352 meters). A review of the GLO plat maps for 1881 and the Master Title Plat provided no information as to the origin of the site (BLM n.d.). The dump consists mostly of modern trash and historic solder-dot cans. The dump is mostly contained within a 7- by 5-feet pile that is about 2-feet deep, with metal fragments and other debris washing down the drainage channel from the main dumpsite. An accurate inventory of the material in the dump was not possible, but the assemblage consists of a large number of solder-dot cans, meat cans, a coffee can, an explosive powder can, plastic bottles, car parts, children's toys, and other modern debris. Site 5LO489 is recommended as not eligible for listing on the NRHP.

Site 5LO490: Site 5LO490 is a small prehistoric open camp located on the crest of a narrow southeast-trending ridge that extends off of the southern escarpment of Peetz Table. The site lies at an elevation of 4,432 feet (1,351 meters). The site consists of a diffuse scatter of lithic debitage, heat-altered rock, and one eroded heat-altered rock cluster. Site 5LO490 is recommended as not eligible for listing on the NRHP.

Site 5LO491: Site 5LO491 is a prehistoric open camp located at an elevation of 4,417 feet (1,346 meters). It is situated on a knoll on top of a narrow southeast-trending ridge that extends from the southern escarpment of Peetz Table. The ridge is flanked by prominent ephemeral streams that drain the area east and south into the South Platte River Valley. The site consists of

scattered lithic debitage and heat-altered rock, one heat-altered rock cluster (Feature 1), one projectile point base, two bifaces, two scrapers, one utilized flake, and one tested cobble. One auger probe excavated east of the feature confirmed the deflated nature of the rocky soils that lack potential to contain intact buried cultural deposits. Site 5LO491 is recommended as not eligible for listing on the NRHP.

Site 5LO492: Site 5LO492 is a prehistoric open camp located on the crest of a low, flat east-trending ridge near the southern edge of Peetz Table. Specifically, it is situated within a fallow field at an elevation of 4,333 feet (1,321 meters). The site consists of a scatter of lithic debitage and heat-altered rock, one biface, one core, one piece of groundstone, one modified cobble, one etched stone, and one tested cobble. Seventeen auger tests were excavated in a grid pattern within the central portion of the site area to assess the potential for buried cultural deposits. The 17 auger tests yielded negative results for cultural remains. Site 5LO492 is recommended as not eligible for listing on the NRHP.

Site 5LO493: Site 5LO493 is a small prehistoric lithic scatter located on an east-trending ridge that overlooks Spring Canyon from the southern rim of Peetz Table. The site lies at elevation of 4,320 feet (1,317 meters). The site consists of a sparse lithic scatter of six white to clear mottled chert flakes and three tested cobbles that exhibit from three to five flake scars each. The artifacts occur in a small heavily eroded area with numerous limestone outcrops. No evidence of digging or quarrying was observed at the site, which appears to be a casual secondary procurement locale. Site 5LO493 is recommended as not eligible for listing on the NRHP.

Site 5LO494: Site 5LO494 is a small prehistoric lithic scatter located on a narrow south-trending finger ridge that extends from the southern escarpment of Peetz Table. It lies at an elevation of 4,355 feet (1,327 meters) and overlooks Spring Canyon. The site consists of a diffuse scatter of 15 early-stage white to clear pieces of chert debitage, one purple chalcedony secondary flake, and two bifaces. Biface 1 exhibits six bifacial flake scars along one edge and is 5 by 4 by 1.5 centimeters in size. Biface 2 is the distal end of a preblank that is 4.5 by 3 by 2 centimeters. Site 5LO494 is recommended as not eligible for listing on the NRHP.

Site 5LO495: Site 5LO495 is a small prehistoric open camp that lies at an elevation of 4,353feet (1,327 meters) and overlooks Spring Canyon. It is located at the southern edge of an undulating east-trending ridge that forms part of the southern escarpment of Peetz Table. The site consists of a diffuse lithic scatter of 20 white to clear chert secondary flakes, four heat-altered limestone fragments, one core, and one biface. The core is a piece of white to clear chert that exhibits six bifacial flake scares and measures 5 by 3.5 by 3 centimeters. The biface is a piece of white to clear chert that exhibits nine bifacial flake scars along one edge and measures 5.5 by 3.5 by 2 centimeters. Site 5LO495 is recommended as not eligible for listing on the NRHP.

Site 5LO496: Site 5LO496 is a small prehistoric open camp located on a low conical hill at an elevation of 4,403 feet (1,342 meters). The hill lies on a northeast/southwest-trending ridge on top of Peetz Table that is bordered to the south by a prominent ephemeral stream that drains the area east into Spring Canyon. The site consists of a diffuse lithic scatter composed of two

bifaces, one scraper, one core, one tertiary and one secondary flake of white opaque chert, and eight fragments of heat-altered rock (four quartzite and four limestone).

Four auger tests were excavated on the site from the top of the low hill down the southeastern slope to assess the potential for subsurface cultural deposits. No cultural material was recovered from any of the tests, and the sediments throughout the site do not have the potential to contain significant subsurface cultural deposits. Site 5LO496 is recommended as not eligible for listing on the NRHP.

Site 5LO497: Site 5LO497 is a historic homestead located at an elevation of 4,324 feet (1,318 meters). It is situated on the southern edge a broad plain overlooking the South Platte River valley from the southern escarpment of Peetz Table. South-flowing ephemeral drainages are present along the escarpment, and one of the structures on the site is partly built into the cutbank of one of these stream cuts. A review of the GLO plat maps for 1881 and the Master Title Plat provided no information as to the origin of this site. There are no 1881 GLO plots within Section 11, T11N, R50W, nor are there any listings or patents shown on the Master Title Plat and historical indices for Section 11 (BLM n.d.). The site may have been squatted on with the intent to file a homestead patent, but the intention was never followed through and the site was abandoned. The site consists of a concrete basement, a concrete box, a concrete wall, historic glass and ceramic fragments, bricks, and metal. Site 5LO497 is recommended as not eligible for listing on the NRHP.

Site 5LO498: Site 5LO498 is a prehistoric open camp located at the southern crest of the Peetz Table escarpment. It lies at an elevation of 4,304 feet (1,312 meters) and overlooks the South Platte River valley. The site consists of two bifaces, two utilized flakes, one scraper, scattered lithic debitage, and heat-altered rock. Eight auger tests were excavated across the site to assess the potential for subsurface cultural deposits in the deflated residual silty loam. No cultural material was recovered from any of the tests, and the depositional environment does not have the potential for significant buried archaeological remains. Site 5LO498 is recommended as not eligible for nomination to the NRHP.

Site 5LO499: Site 5LO499 represents a former homestead located on a conical hill on an east-trending ridge that projects from the southern edge of Peetz Table. It lies at an elevation of 4,378 feet (1,334 meters), and overlooks a prominent drainage to the north that flows east into Spring Canyon. The site is depicted on the Haystack Butte (1953) USGS 7.5' quadrangle as a small square in the NW of Section 6, T11N, R50W. There is no plotted information shown on the 1881 GLO plat map for T11N, R50W. According to the Master Title Plat and historical indices, Hermann Schluter filed for and received a homestead entry patent (HE 586337) for 161.19 acres (Lots 1-4) in Section 6 on May 28, 1917. Schluter received the patent from the Sterling Land Office of the GLO under the original Homestead Entry law of May 20, 1862. The entry has not been cancelled (BLM n.d.). The site consists of four historic features and assorted scattered debris. Site 5LO499 is recommended as not eligible for listing on the NRHP.

Site 5LO500: Site 5LO500 consists of a historic homestead located on a hill situated on an east-trending ridge that projects from the southern edge of Peetz Table. The site lies at an elevation

of 4,395 feet (1,340 meters) and overlooks a prominent drainage to the north that flows east into Spring Canyon. There is no plotted information shown on the 1881 GLO plat map for T11N, R50W. According to the Master Title Plat and historical indices, Henry Erdwins filed for and received a homestead entry patent (HE 319398) for 161.07 acres in Section 6 on March 18, 1913. Erdwins received the patent from the Sterling Land Office of the GLO under the original Homestead Entry law of May 20, 1862. The entry has not been cancelled (BLM n.d.). The site consists of four historic features and a scattered historic artifact assemblage. Site 5LO500 is recommended as not eligible for listing on the NRHP.

Site 5LO501: Site 5LO501 is a prehistoric lithic scatter located at an elevation of 4,360 feet (1,329 meters). It lies in a low saddle between two low hills on a prominent east-trending ridge that extends from the southern edge of Peetz Table and terminates at along the west side of Spring Canyon. The site consists of four Flat Top chert tertiary flakes, four chalcedony tertiary flakes, two chalcedony primary flakes, and one brown opaque chert core. Four auger probes were excavated on the site to assess its potential for subsurface cultural material. No evidence of a buried cultural layer was observed in the tests. Site 5LO501 is recommended as not eligible for listing on the NRHP.

Site 5LO502: Site 5LO502 is a prehistoric open camp and opportunistic quarry located on a low hill between two north-flowing ephemeral drainages. It lies at an elevation of 4,383 feet (1,336 meters), and the hill is part of a prominent east-trending ridge that extends from the southern edge of Peetz Table and terminates at Spring Canyon. The site consists of an eroded cluster of heat-altered limestone, four biface fragments, two cores, a small lithic debitage scatter, and seven scattered fragments of heat-altered limestone. Site 5LO502 is recommended as not eligible for listing on the NRHP.

Site 5LO503: Site 5LO503 is a prehistoric open camp and lithic quarry located at the eastern terminus of a prominent east-trending ridge that extends from the southern edge of Peetz Table and terminates at Spring Canyon. The site lies at an elevation of 4,320 feet (1,317 meters) and commands an excellent view of the South Platte River valley to the southeast. The site consists of 27 pieces of heat-altered rock (18 limestone and nine quartzite), one biface, two cores, two tested cobbles, and scattered lithic debitage. The majority of the debitage appears to have been casually quarried from the limestone outcrops that are present along the margins of the prominent ridge. Three auger tests were excavated on the site to assess its potential for buried cultural material. None of the tests yielded evidence of a buried cultural component. Site 5LO503 is recommended as not eligible for nomination to the NRHP. The site is limited to a meager campsite and surface artifact scatter in an area lacking the potential for significant buried cultural deposits. Auger tests excavated at the site recovered no evidence of subsurface cultural material or of sedimentation conducive to preserving a cultural component. This site lacks intact dateable features and temporally diagnostic artifacts. The modest artifact assemblage lacks sufficient density and diversity to yield information other than identifying that opportunistic tool stone acquisition and expedient tool reduction took place on the site. There are no exotic toolstone materials present on the site that would indicate source locations or trade patterns. Overall, the site lacks data that could provide significant information or insights concerning site activities, site functions, subsistence or settlement patterns, or other topics of research interest.

Site 5LO504: Site 5LO504 is a prehistoric open camp situated in a plowed field on the south-facing slope of a low hill. It lies at an elevation of 4,307 feet (1,313 meters) within the southern region of Peetz Table and overlooks the South Platte River valley. The site consists of 34 fragments of heat-altered rock (20 dispersed fragments of quartzite and 14 fragments of limestone), two scrapers, two tested cobbles, and a small lithic debitage scatter. Six auger tests were excavated on the site to assess its potential to contain buried cultural material. No evidence of a buried cultural component was recovered from the tests. Site 5LO504 is recommended as not eligible for nomination to the NRHP.

Site 5LO557: Site 5LO557 represents a former homestead that consists of five feature outlines and an isolated scatter of historic debris. The site is depicted on the Peetz United States Geological Survey (USGS) topographic quadrangle in the SWSENENWSE of Section 26, T12N, R51W. It is located at an elevation of 4,390 feet (1,338 meters) on a low conical-shaped hill or knoll that lies on a gently southeast-sloping upland alluvial plain near the southern edge of Peetz Table. The site slopes toward and overlooks the upper reaches of Spring Canyon to the southeast. There is no plotted information shown on the 1881 GLO plat map for T12N, R51W. According to the Master Title Plat and historical indices, William Genereux filed for and received a homestead entry patent (HE 368770) for 160 acres on December 2, 1913. Genereux received the patent from the Sterling Land Office of the GLO under the original Homestead Entry law of May 20, 1862. The entry has not been cancelled (BLM n.d.). All of the features within the homestead consist of nothing more than grassy imprints on the ground surface from the sown winter wheat that is greener and taller than the surrounding sown crop. They appear to represent the former dwelling and outbuildings; however, they are devoid of extant wood, masonry, stone, or concrete as part of the features, and there are no artifacts. Site 5LO557 is recommended as not eligible for listing on the NRHP.

Site 5LO558: Site 5LO558 represents an abandoned homestead with five features, seven modern corrugated grain bins of various sizes, and an assortment of modern and historic utilitarian items and machinery parts. The site is depicted on the Peetz USGS topographic quadrangle as a residential farm complex in the ENENW of Section 26, T12N, R51W. It is located about 4.5 miles (7.2 kilometers) east of Highway 113 and about 600 feet (183 meters) south of County Road 78. The site is situated at an elevation of 4,412 feet (1,345 meters) on a low knoll that lies on a gently southeast-sloping upland alluvial plain near the southern edge of Peetz Table. There is no plotted information shown on the 1881 GLO plat map for T12N, R51W. According to the Master Title Plat and historical indices, William J. Nollette filed for and received a homestead entry patent (HE 436806) for 160 acres on October 20, 1914. The patent was issued to Nollette by the Sterling Land Office of the GLO under the original Homestead Entry law of May 20, 1862. The entry has not been cancelled (BLM n.d.). Feature 1 is the former house. Feature 2 is a barn located just south of the house. Feature 3 is a wood-frame windmill that lies behind but adjacent to the east end of the house. Feature 4 is a square poured concrete cistern/water tank situated just east of the house and next to the windmill. Feature 5 is a wood- frame garage that is 21 feet east/west by 18 feet north/south. Site 5LO558 is recommended as not eligible for listing on the NRHP.

IV. Effects Determination and Compliance Decision - There are no sites identified on the Phase I private lands that are recommended as eligible. Western has made a determination of **no historic properties affected** by the proposed project

Western would appreciate your comments on the enclosed report as soon as possible, as well as comments on eligibility and effect for the newly recorded sites. If you have any questions about this project, please telephone Rodney Jones, Rocky Mountain Region Office, Loveland, Colorado, at (970) 461-7371 or Mary Barger, Corporate Services Office, at (720) 962-7253.

Sincerely,

Joel K. Bladow
Regional Manager

Enclosure

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

May 18, 2005

Joel K. Bladow
Regional Manager
Western Area Power Administration
P.O. Box 3700
Loveland, CO 80539-3003

Re: Spring Canyon Energy 130 MW Wind Project (Peetz Table Wind Project)

Dear Mr. Bladow:

This office has reviewed your May 11, 2005 correspondence and the cultural resource survey report prepared for the project listed above.

We concur that sites 5LO484 through 5LO504 and 5LO557 are not eligible to the National Register for the reasons stated your May 11 correspondence.

5LO558 is a homestead that is in fairly good condition when compared with others in our database. In order to evaluate this property a better context needs to be developed and further historic data on the homestead needs to be gathered. When was the stucco placed on the buildings? Was it because of the dust bowl? When did abandonment take place?

According to the report 5LO558 will not be impacted by construction of the wind farm, therefore, we concur that no historic properties will be affected.

If we may be of further assistance please contact Jim Green at 303-688-4674.

Sincerely,

Georgianna Contiguglia
State Historic Preservation Officer

GC/WJG

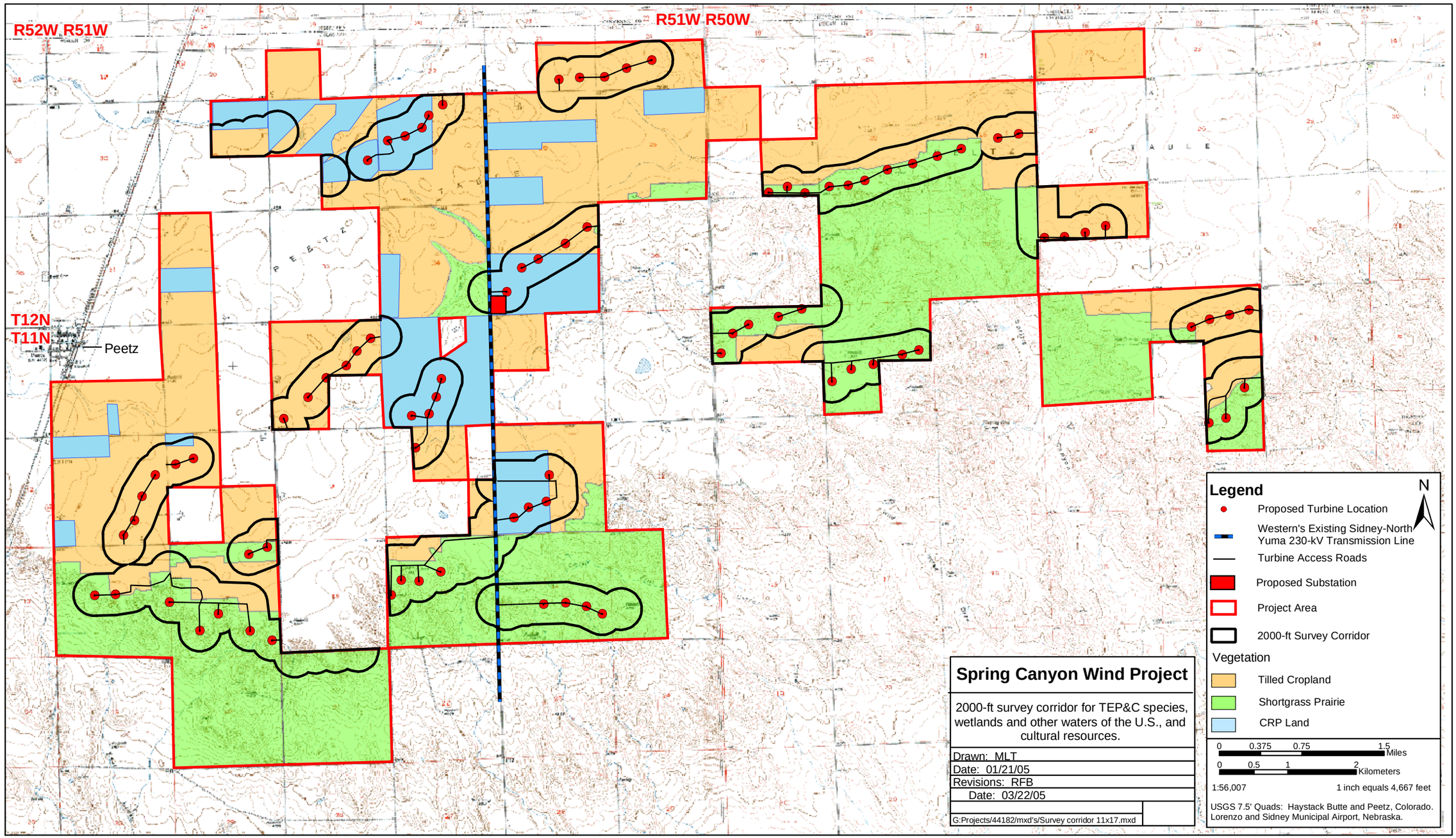


Figure 2.1 2,000-ft Wide Survey Corridor for Federal- and State-Listed Threatened, Endangered, Proposed, and Candidate Species; Wetlands and Other Waters of the U.S.; and Cultural Resources.

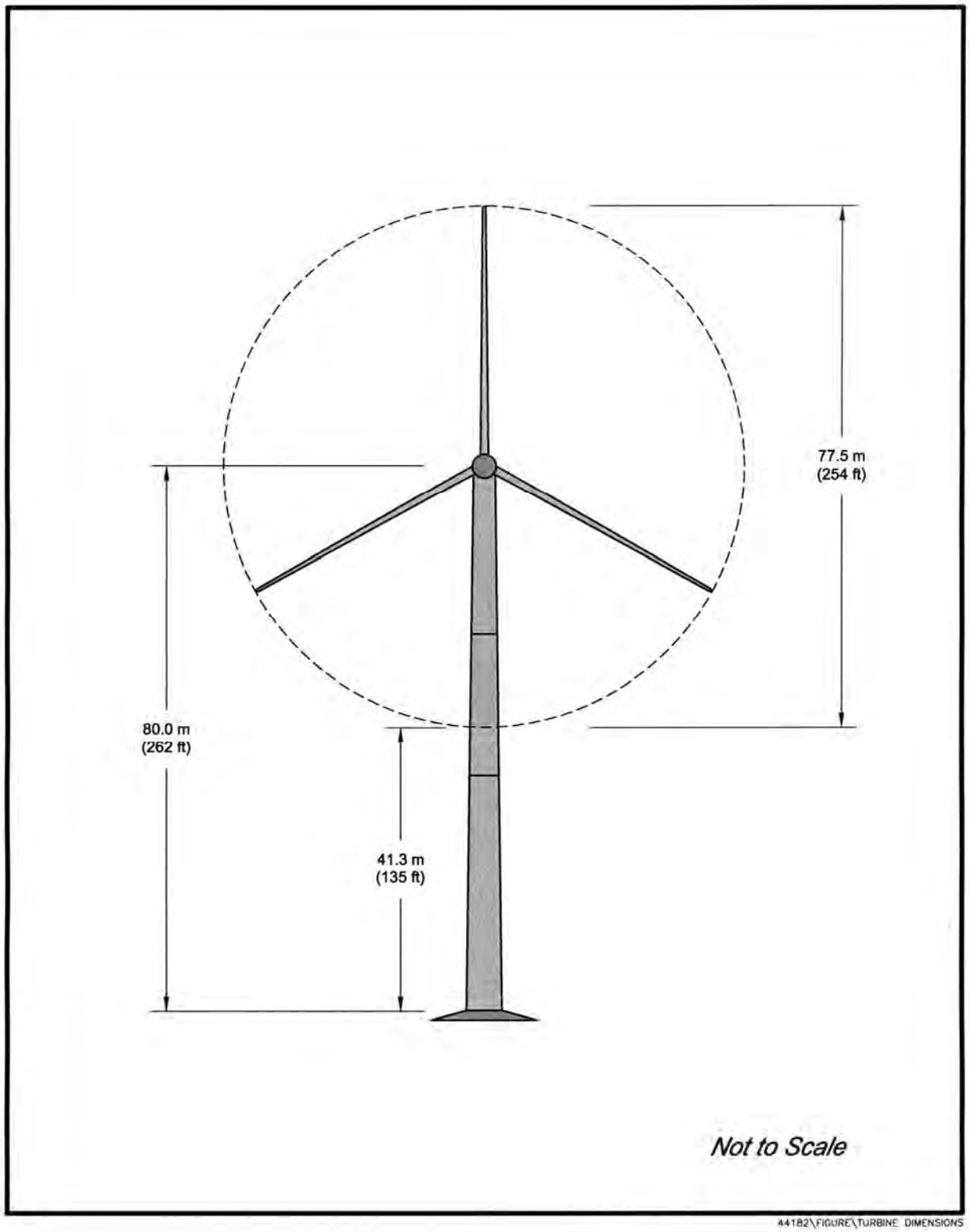


Figure 2.2 Typical Wind Turbine.

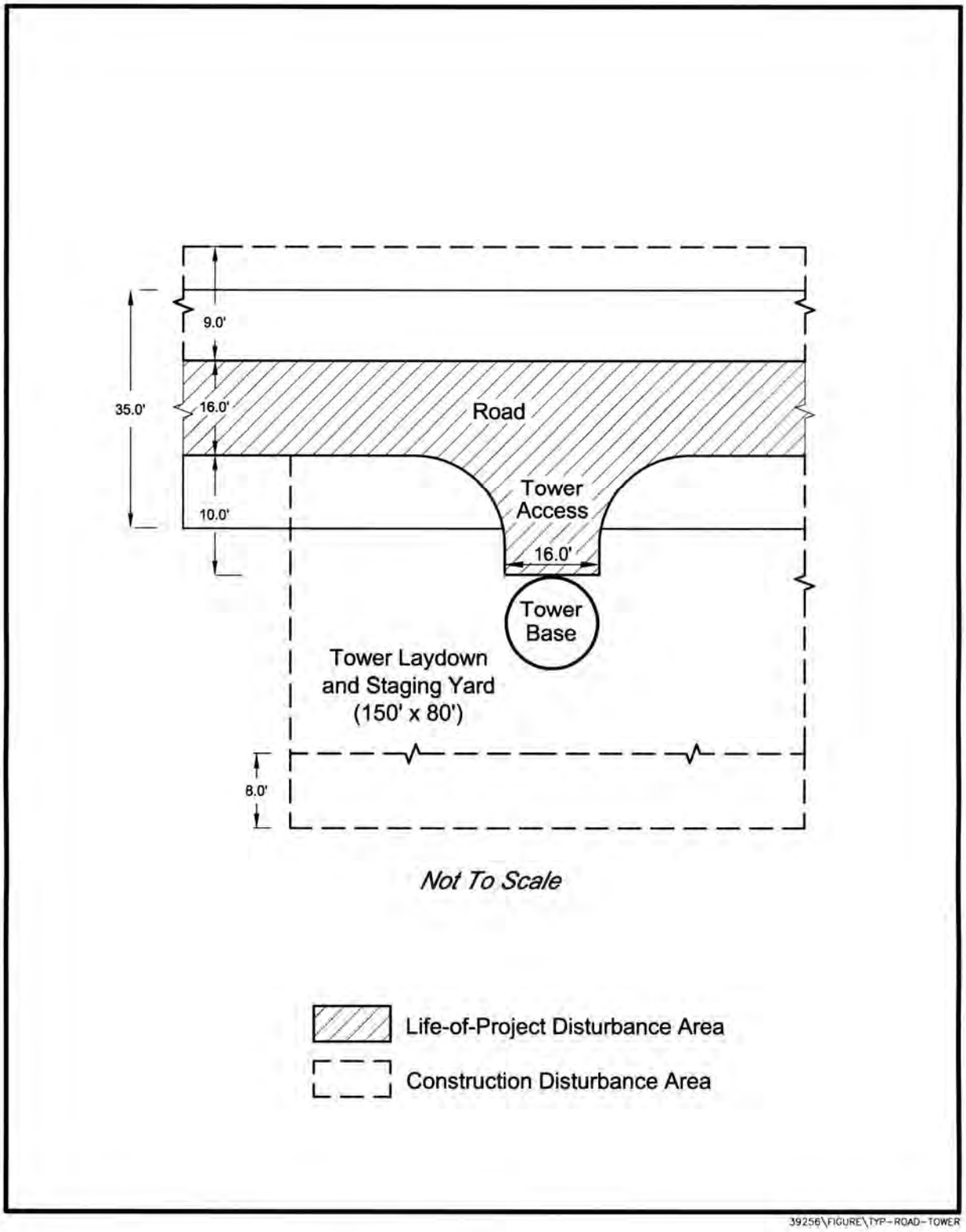


Figure 2.3 Typical Road and Tower Construction Layout.

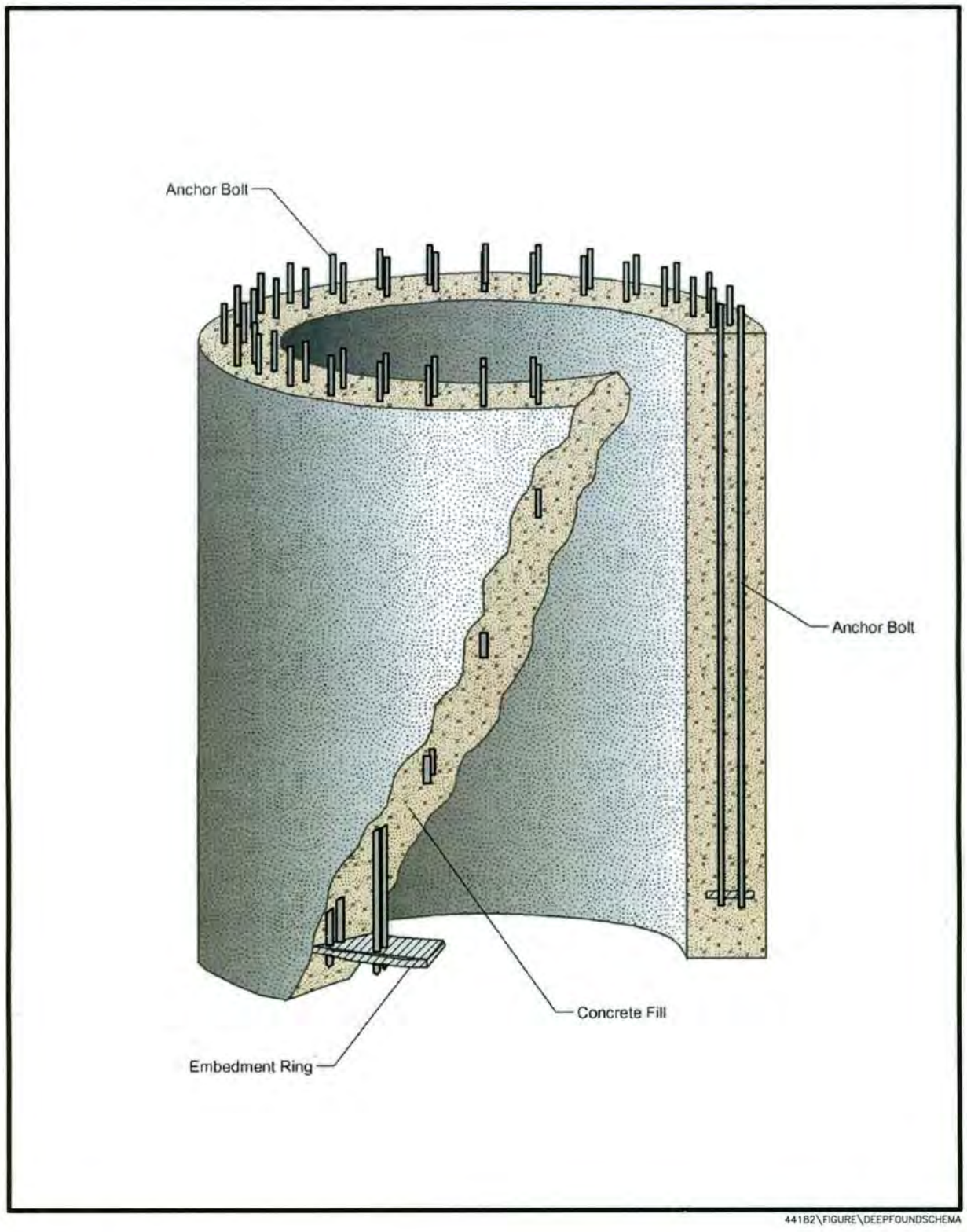


Figure 2.4 Schematic of Deep Foundation.

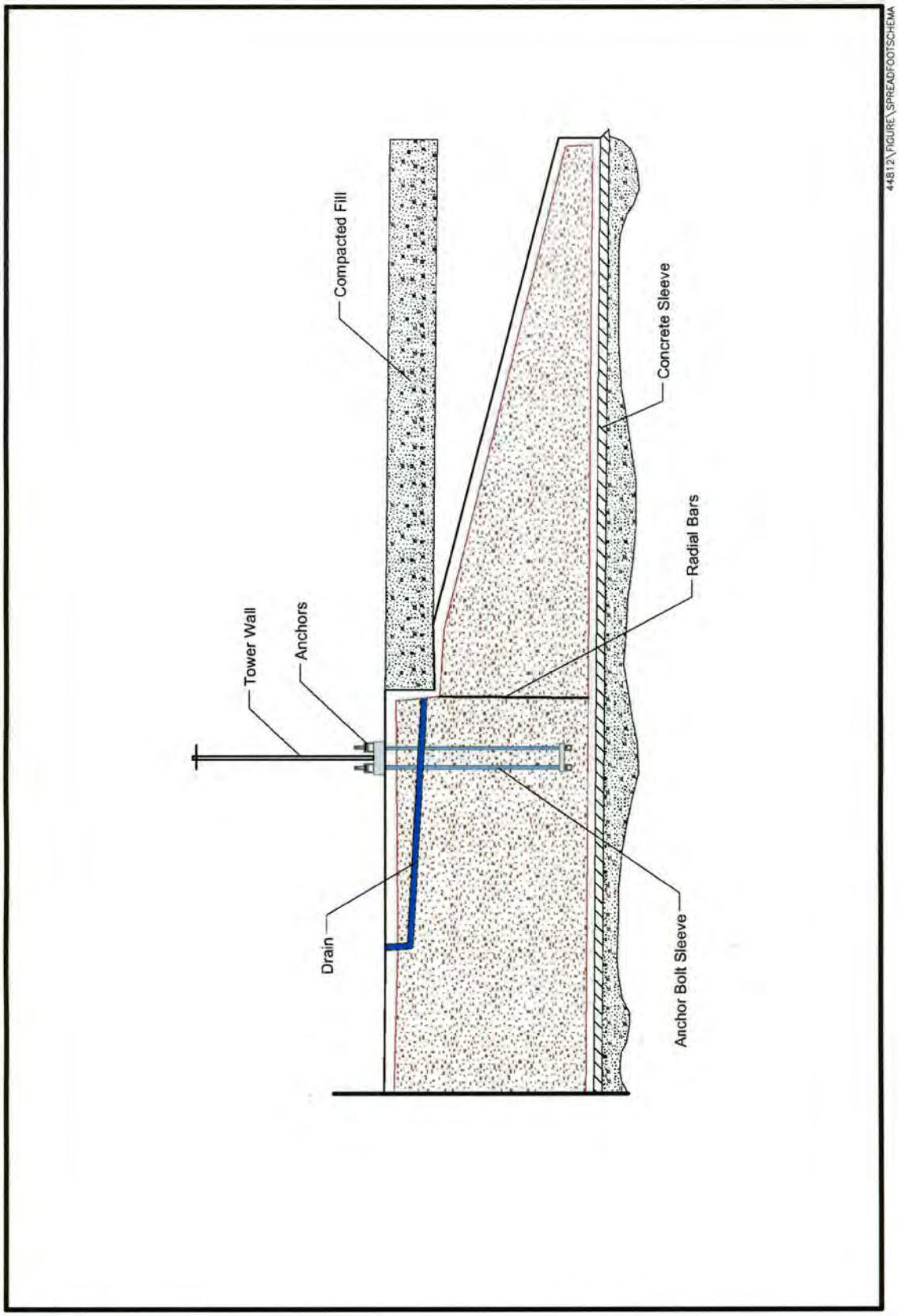


Figure 2.5 Schematic of Shallow Foundation.

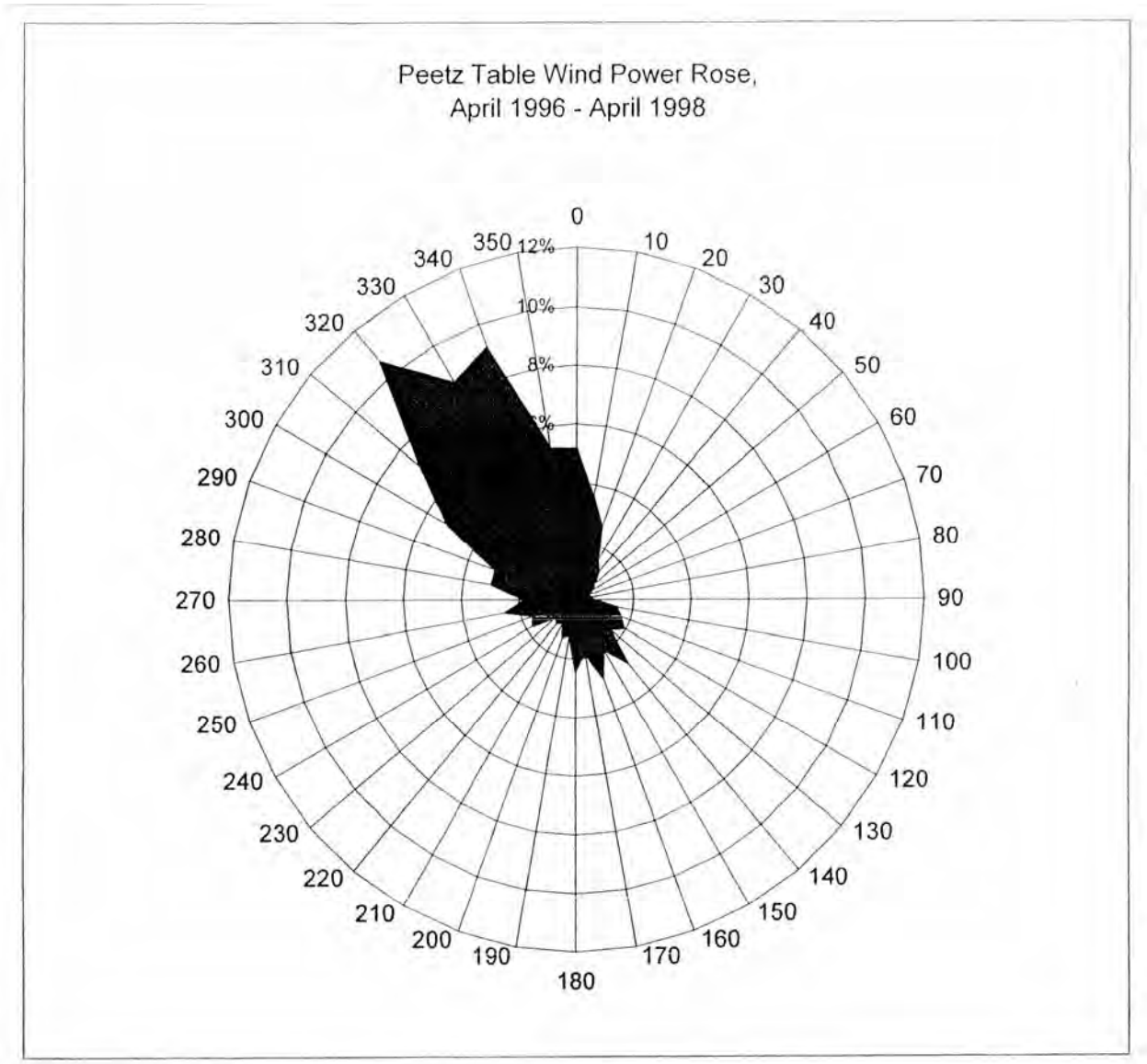


Figure 3.1 Wind Rose for the Spring Canyon Wind Project Area (SCE 2004).

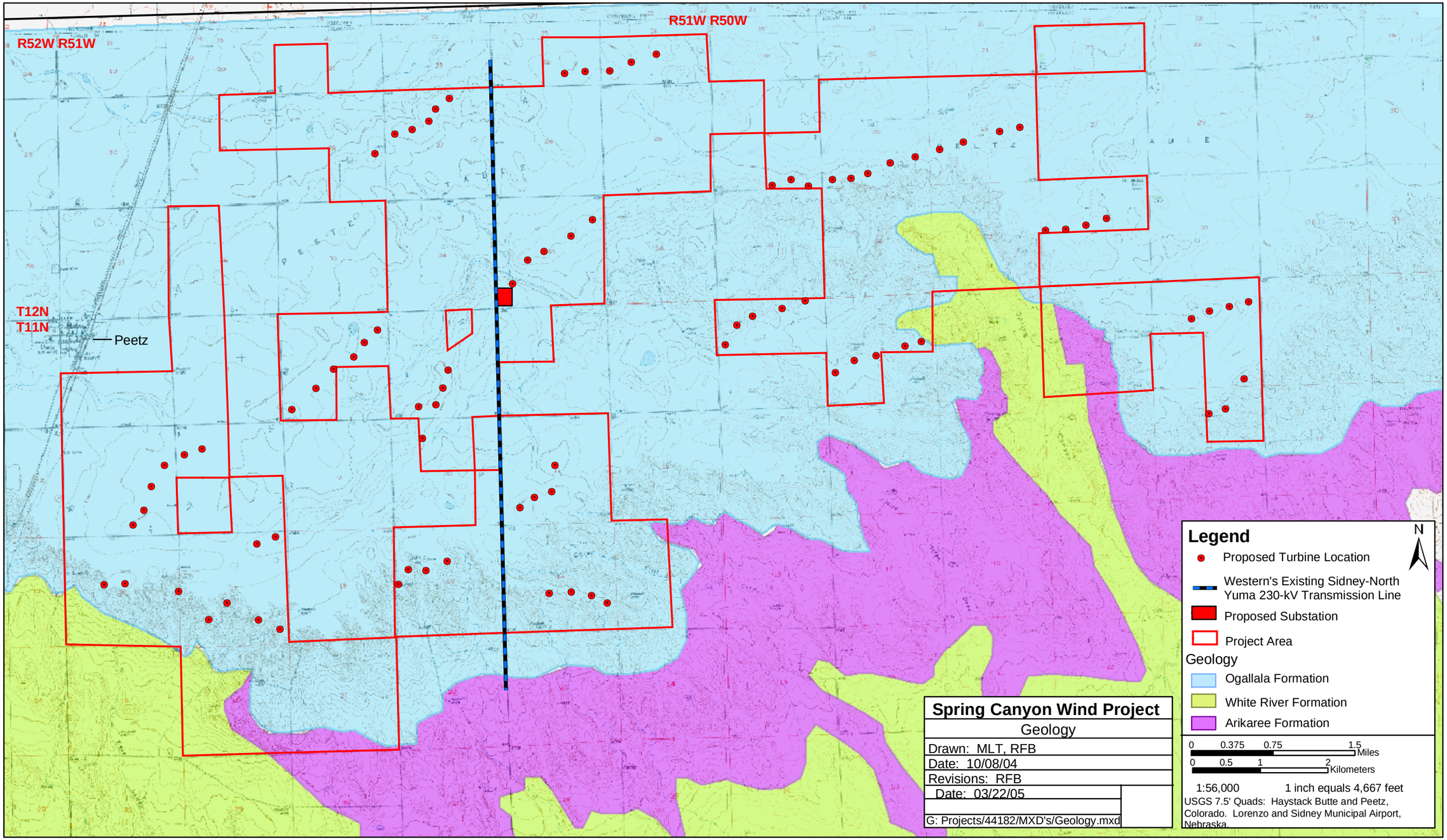


Figure 3.2 Geology.

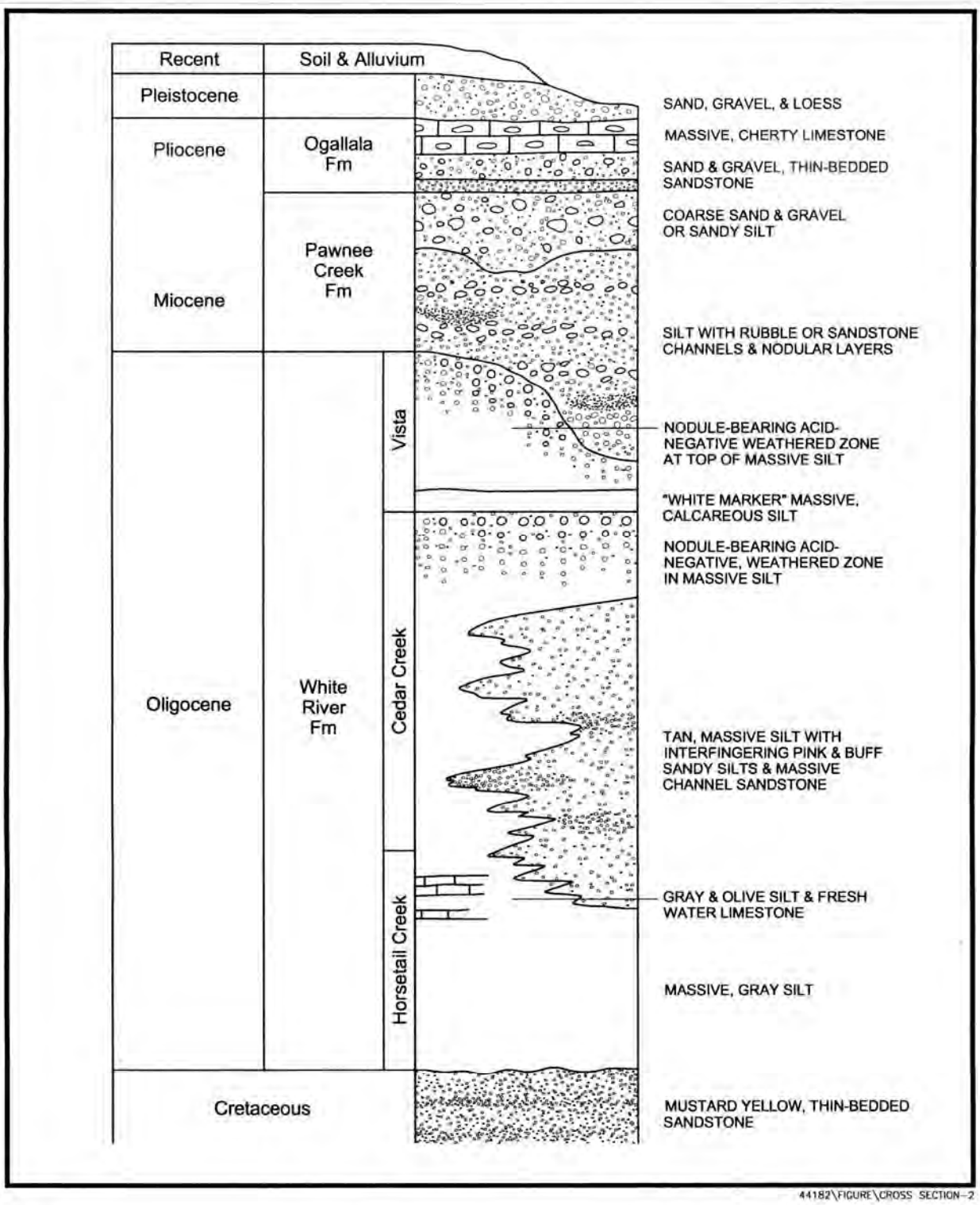


Figure 3.4 Generalized Geologic Section in Logan County, Colorado (from Galbreath 1953). Pawnee Creek Formation = Arikaree Formation, Vista Member and Cedar Creek Member = Brule Member of White River Group of Scott (1978). (In the project area, the White River Group probably only includes the Brule Member. The Arikaree Formation should probably be called the Pawnee Creek Formation. FM = Formation.)

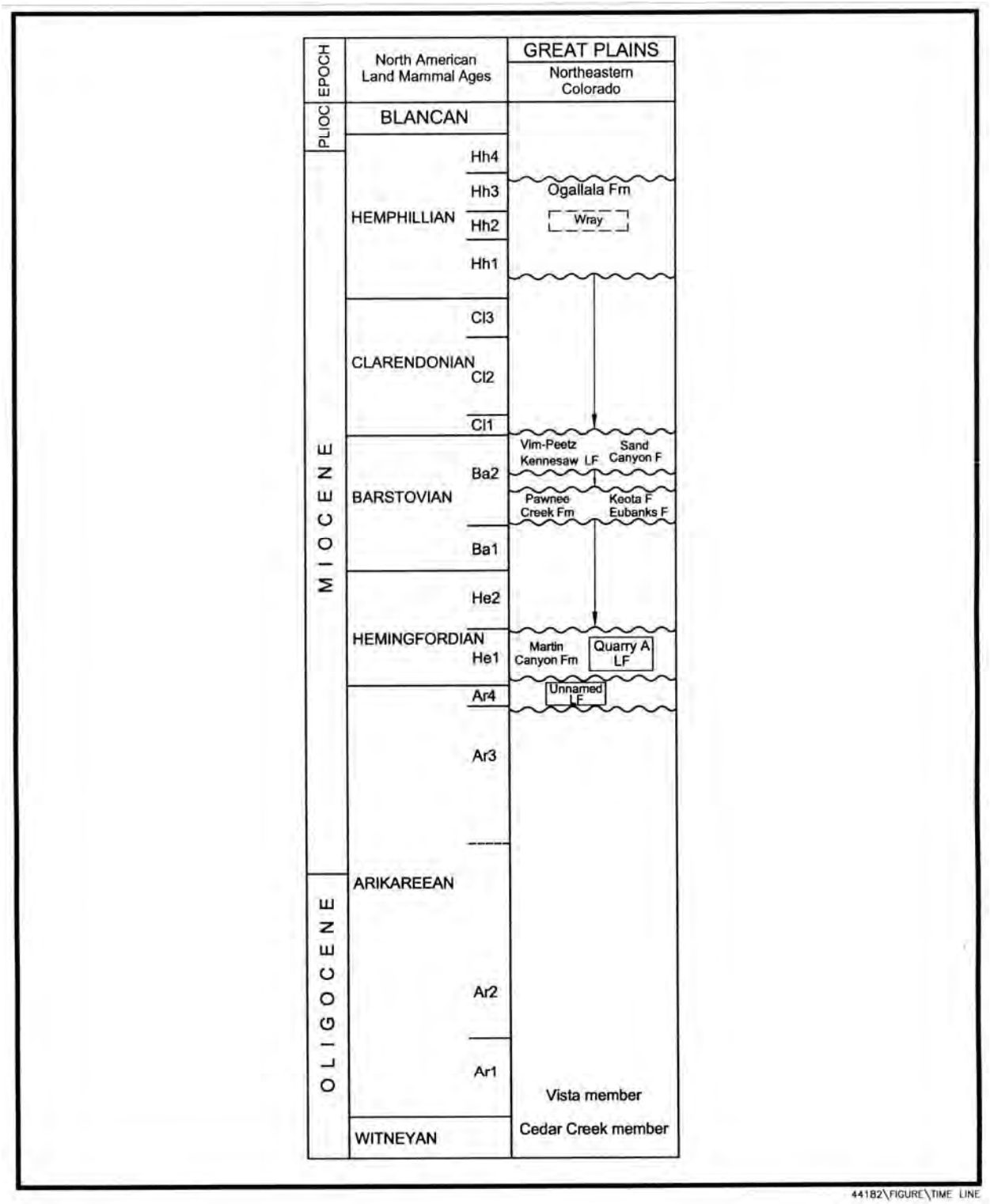


Figure 3.5 Time Relationships of Oligocene and Miocene Rocks in the Project Area Showing Rock Units and Apparent Age Based on Contained Mammalian Fossils (Tedford et al. 2004). (Ma = Millions of Years Ago, FM = Formation, F = Fauna, LF = Local Fauna, A = Quarry Identification Letter).

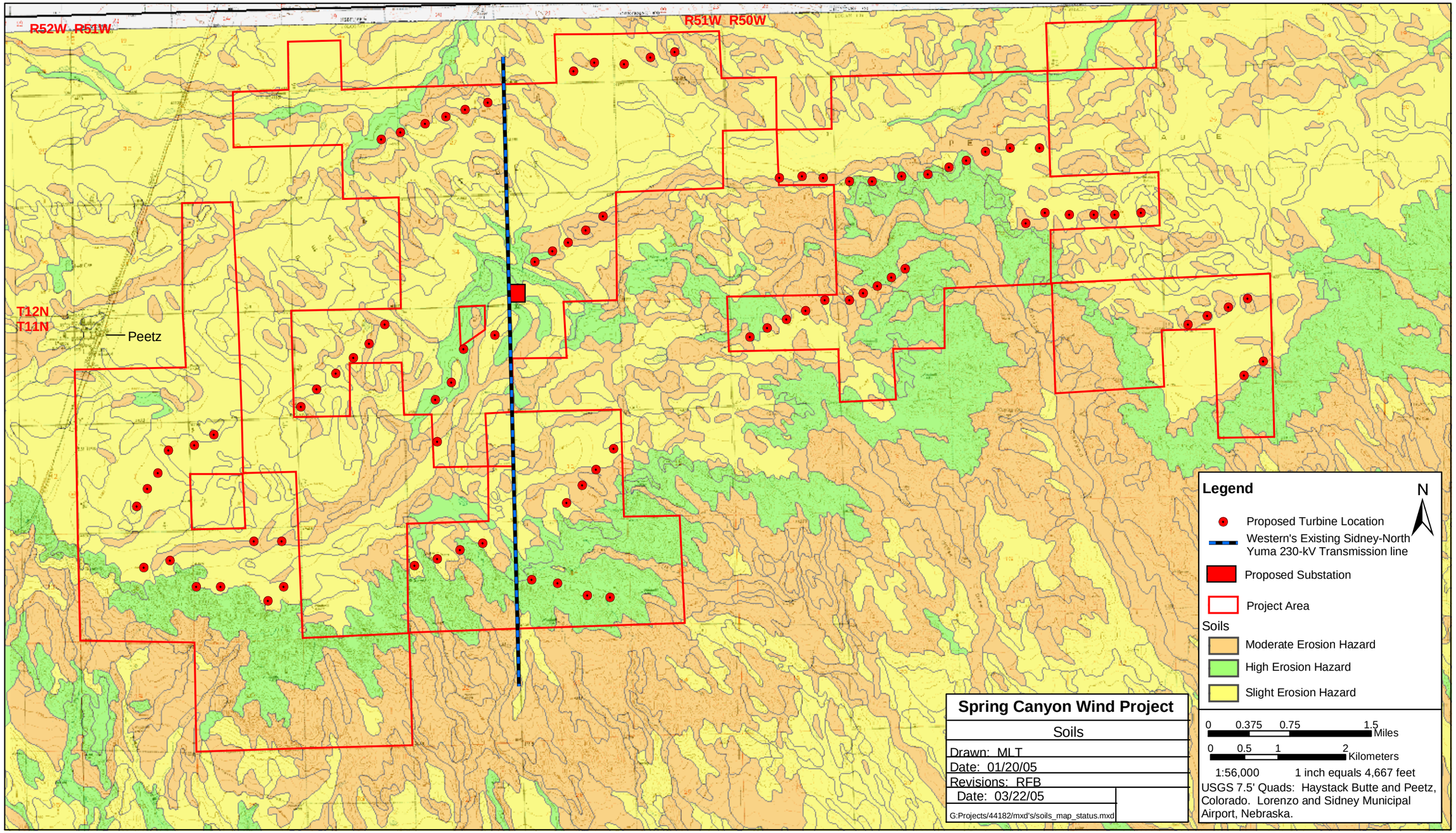


Figure 3.6 Soils With High Erosion Potential.

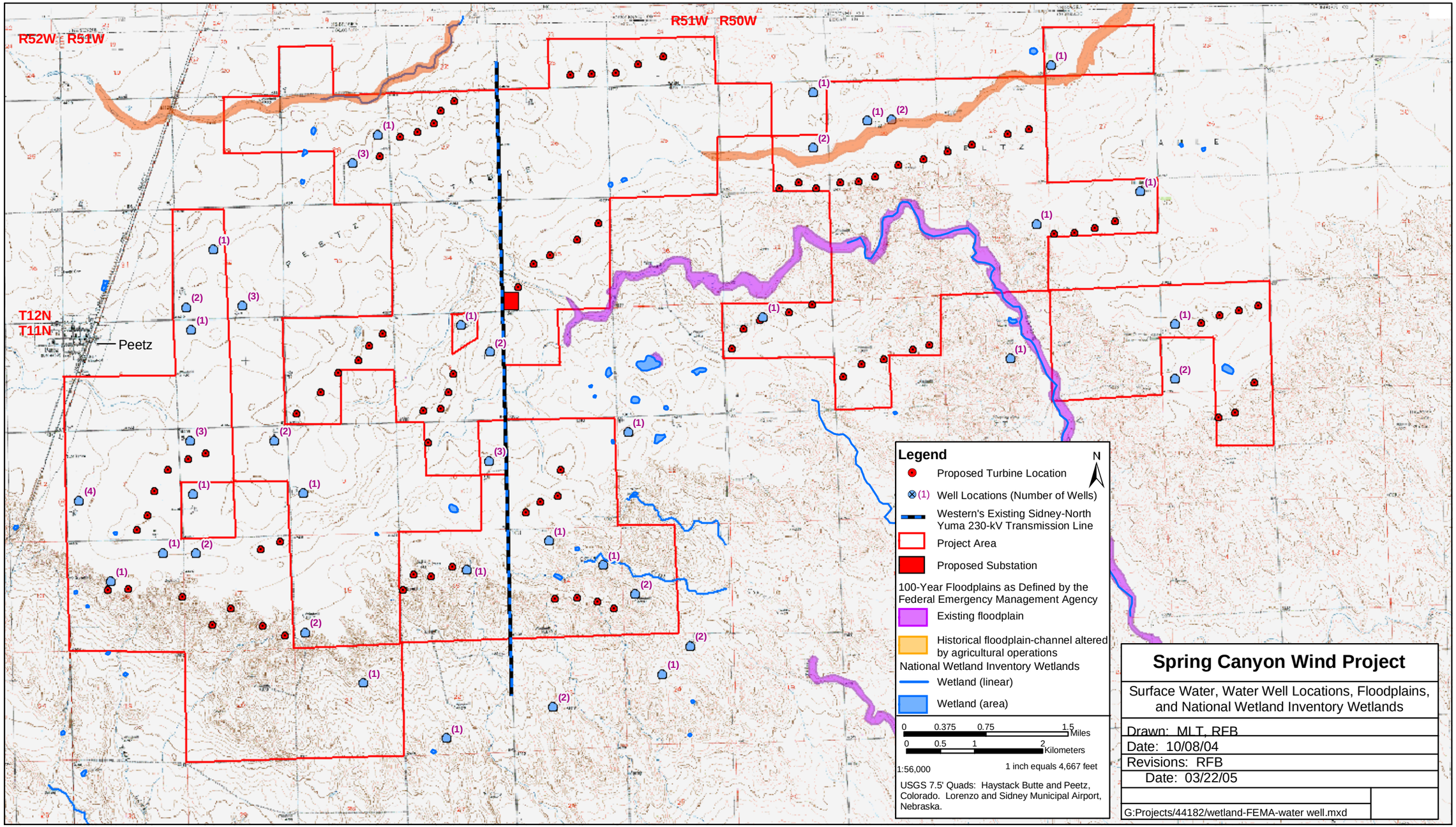


Figure 3.7 Surface Water, Water Well Locations, Floodplains, and National Wetland Inventory Wetlands.

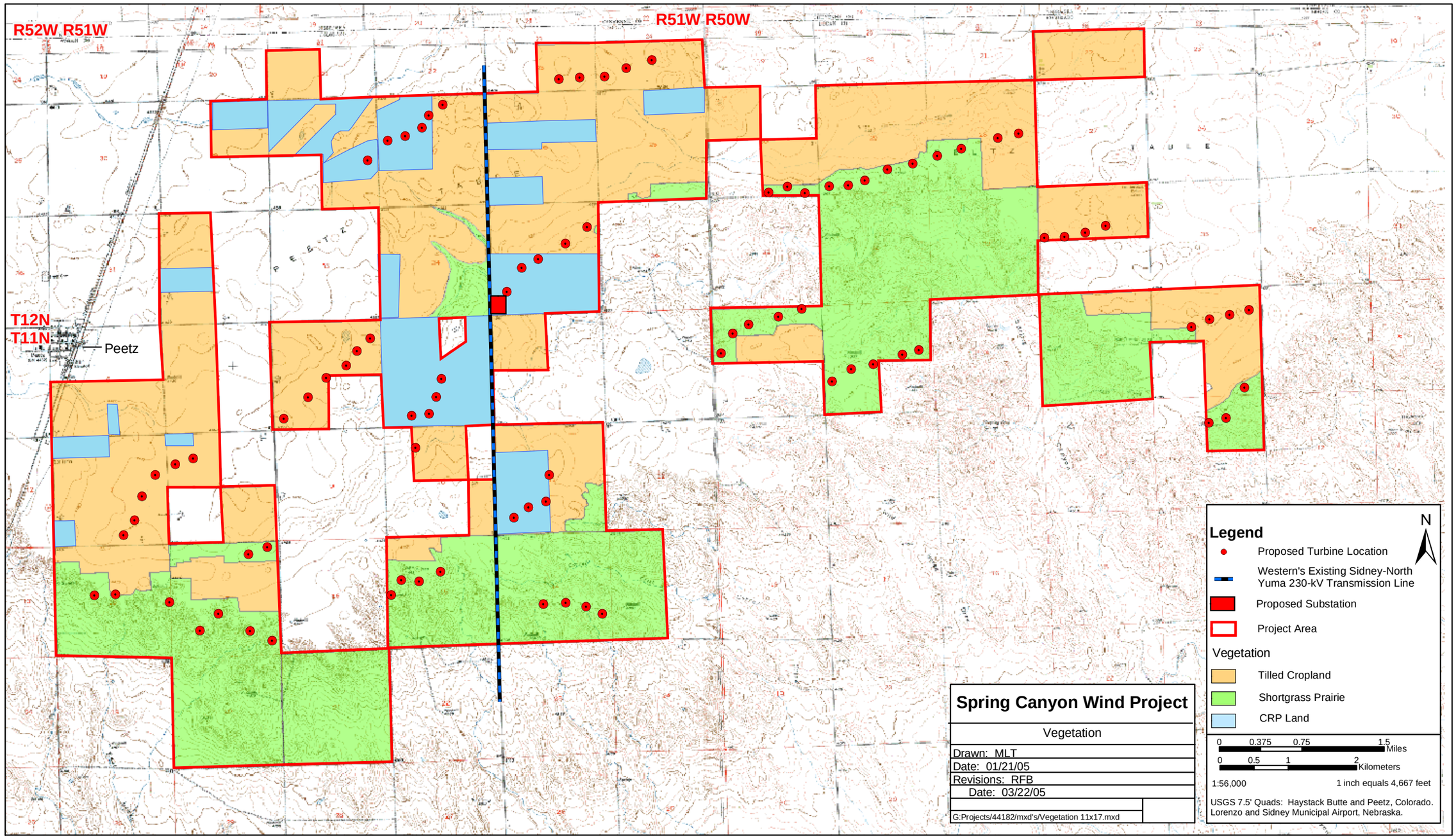


Figure 3.8 Vegetation.

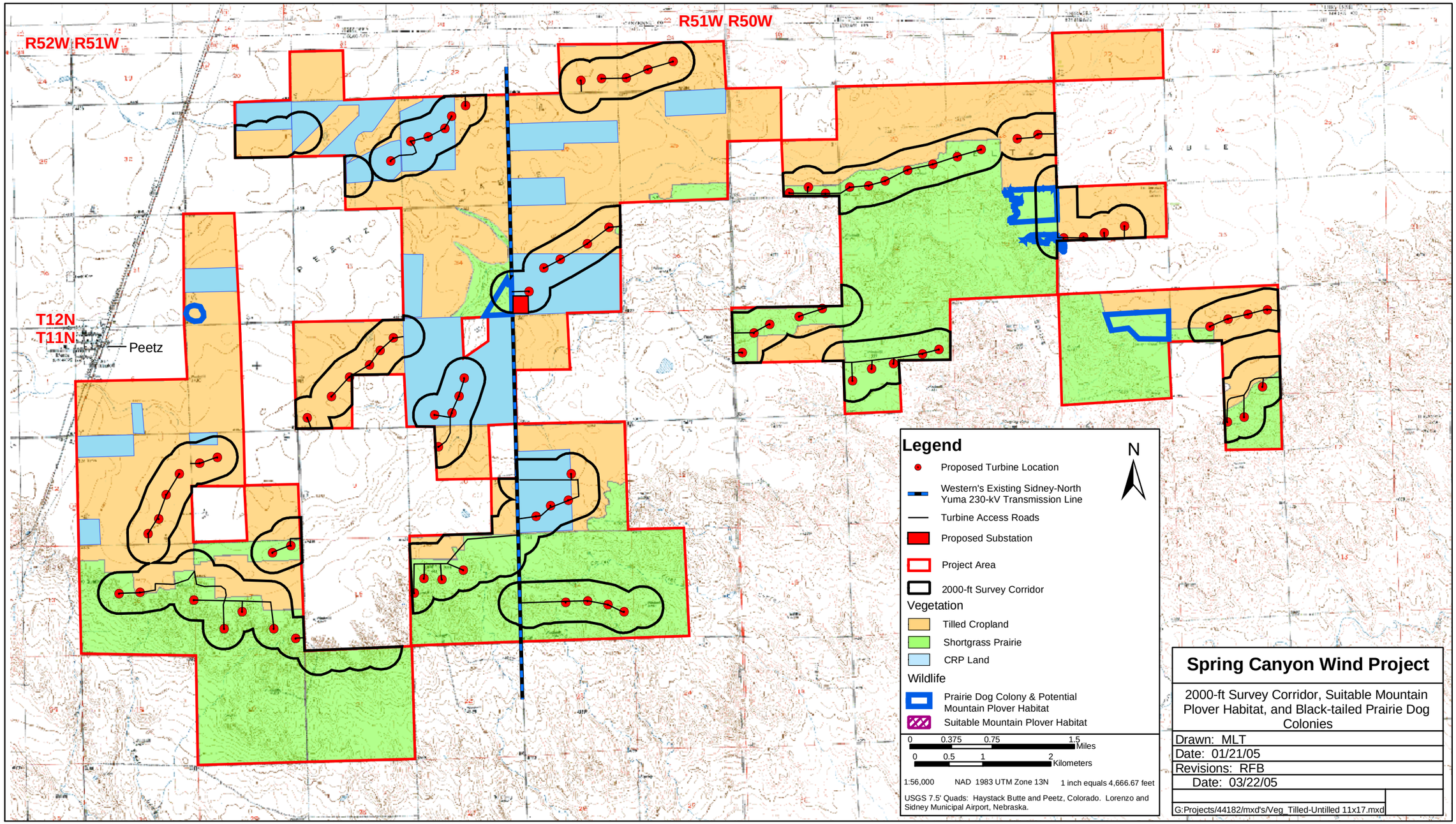


Figure 3.9 Vegetation, Suitable Mountain Plover Habitat, and Prairie Dog Colonies.

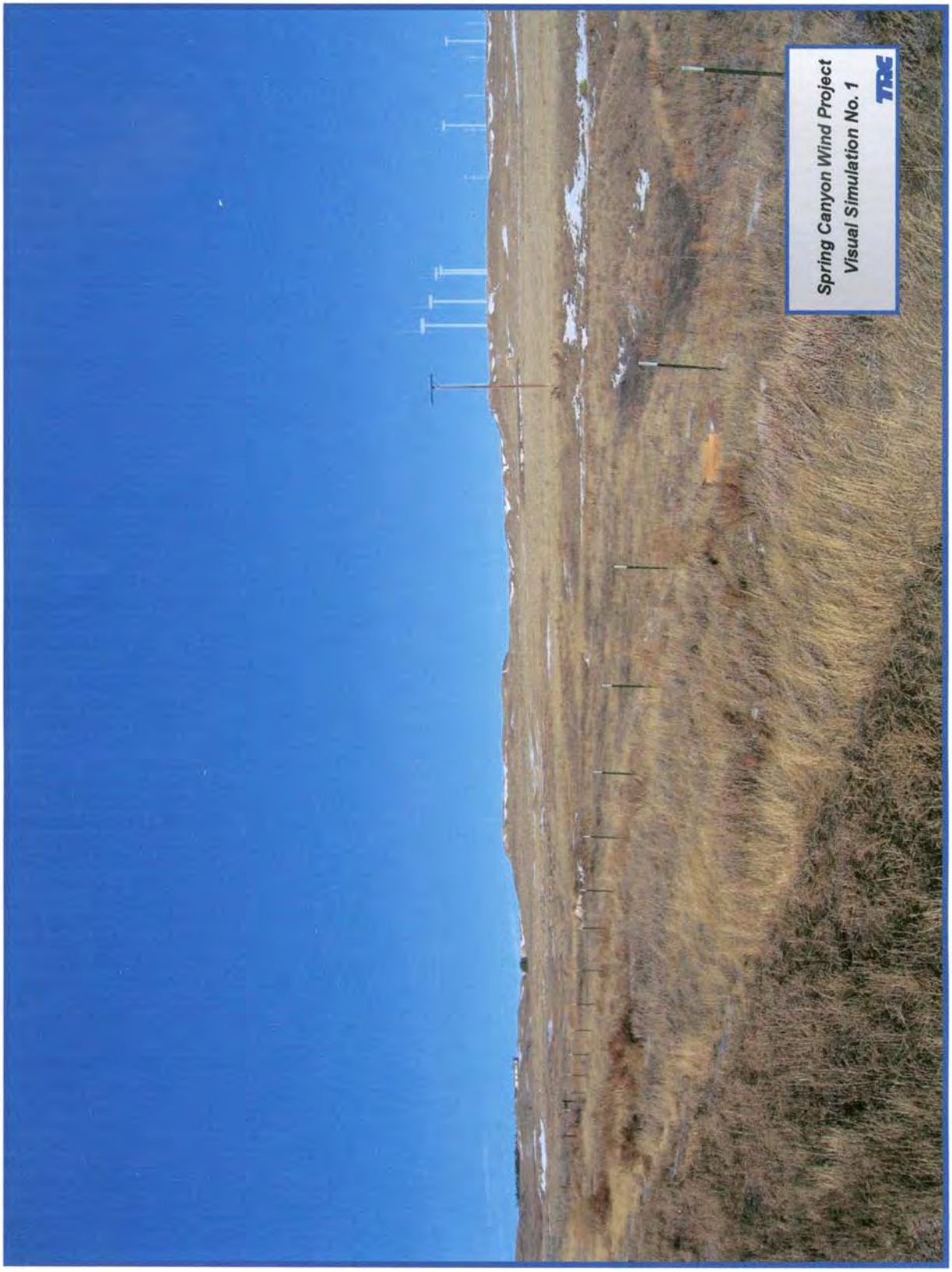


Figure 3.11 Visual Simulation 1 --from South of Peetz on Colorado Highway 113. (Southernmost View).

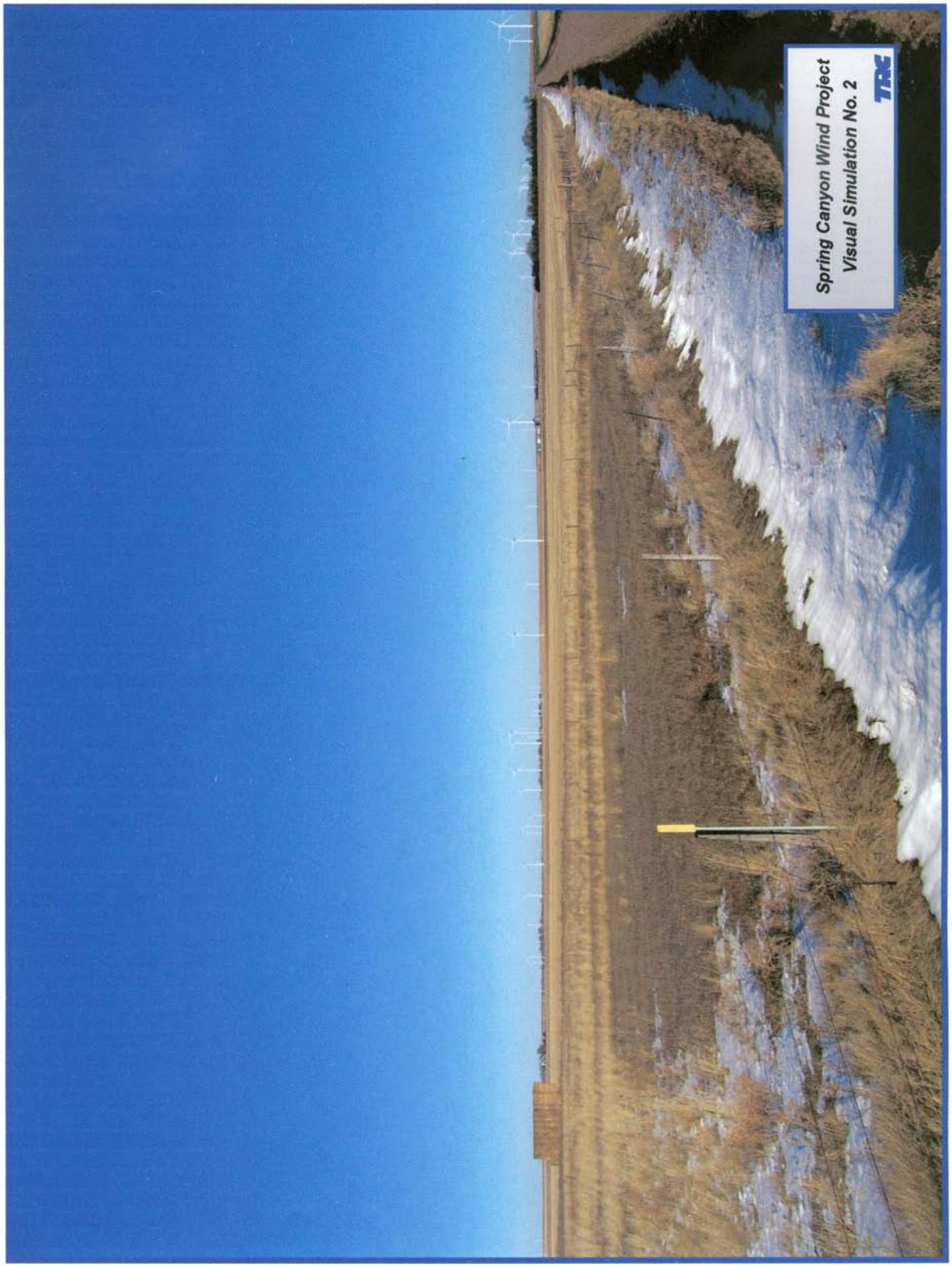


Figure 3.12 Visual Simulation 2--from South of Peetz on Colorado Highway 113.

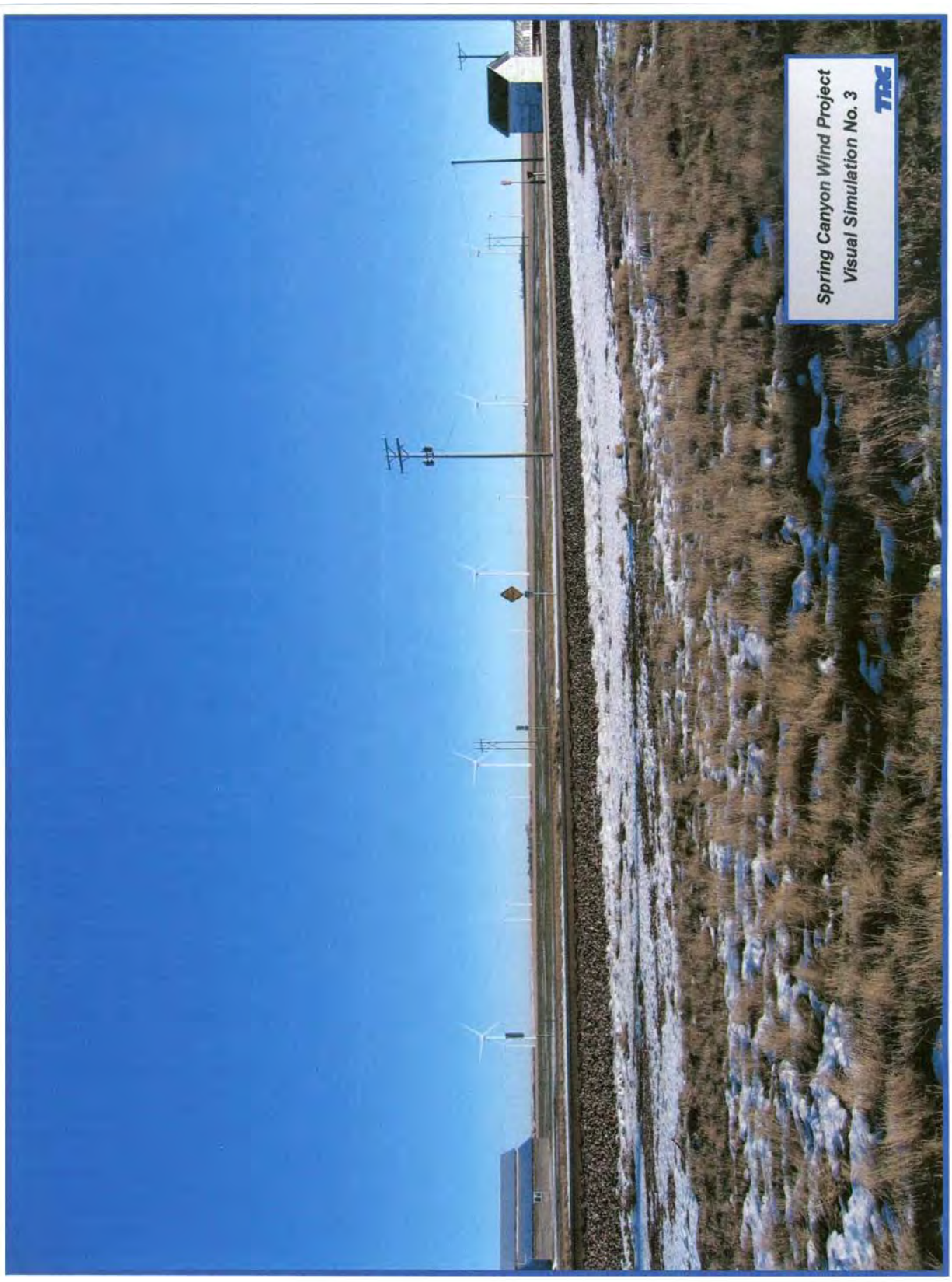


Figure 3.13 Visual Simulation 3--from the Town of Peetz.

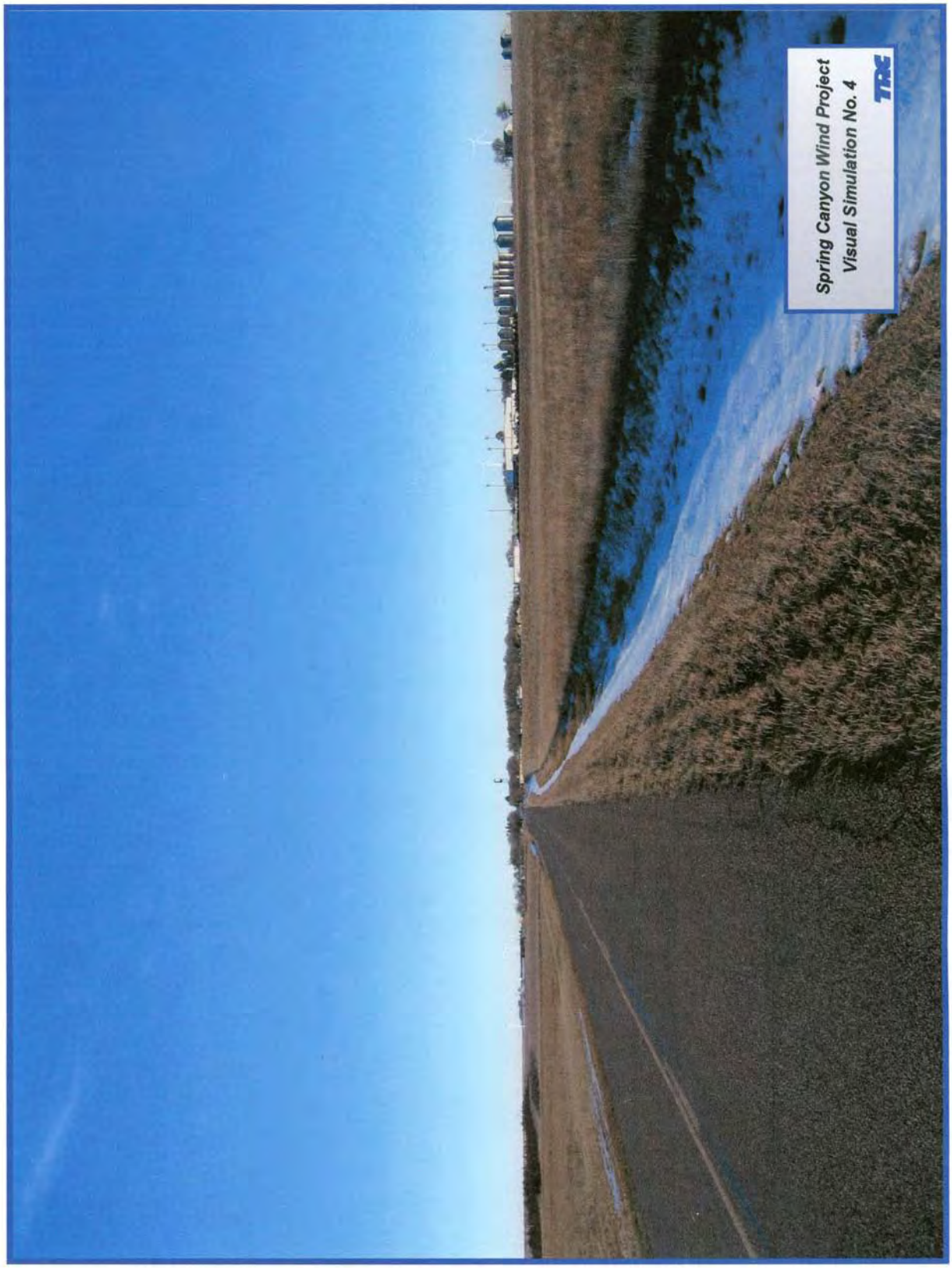


Figure 3.14 Visual Simulation 4--from West of Peetz.

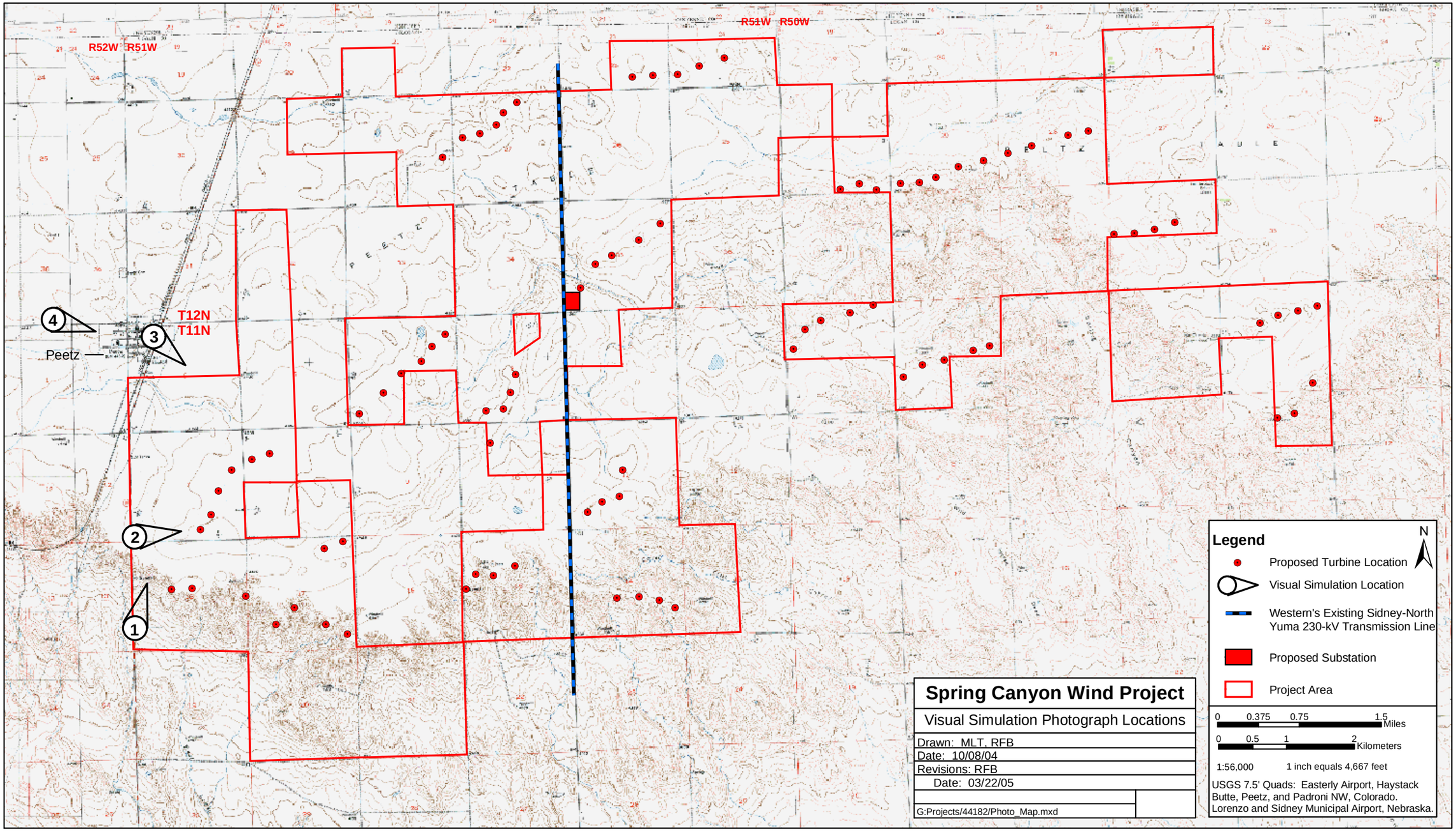


Figure 3.15 Location of Visual Simulations.

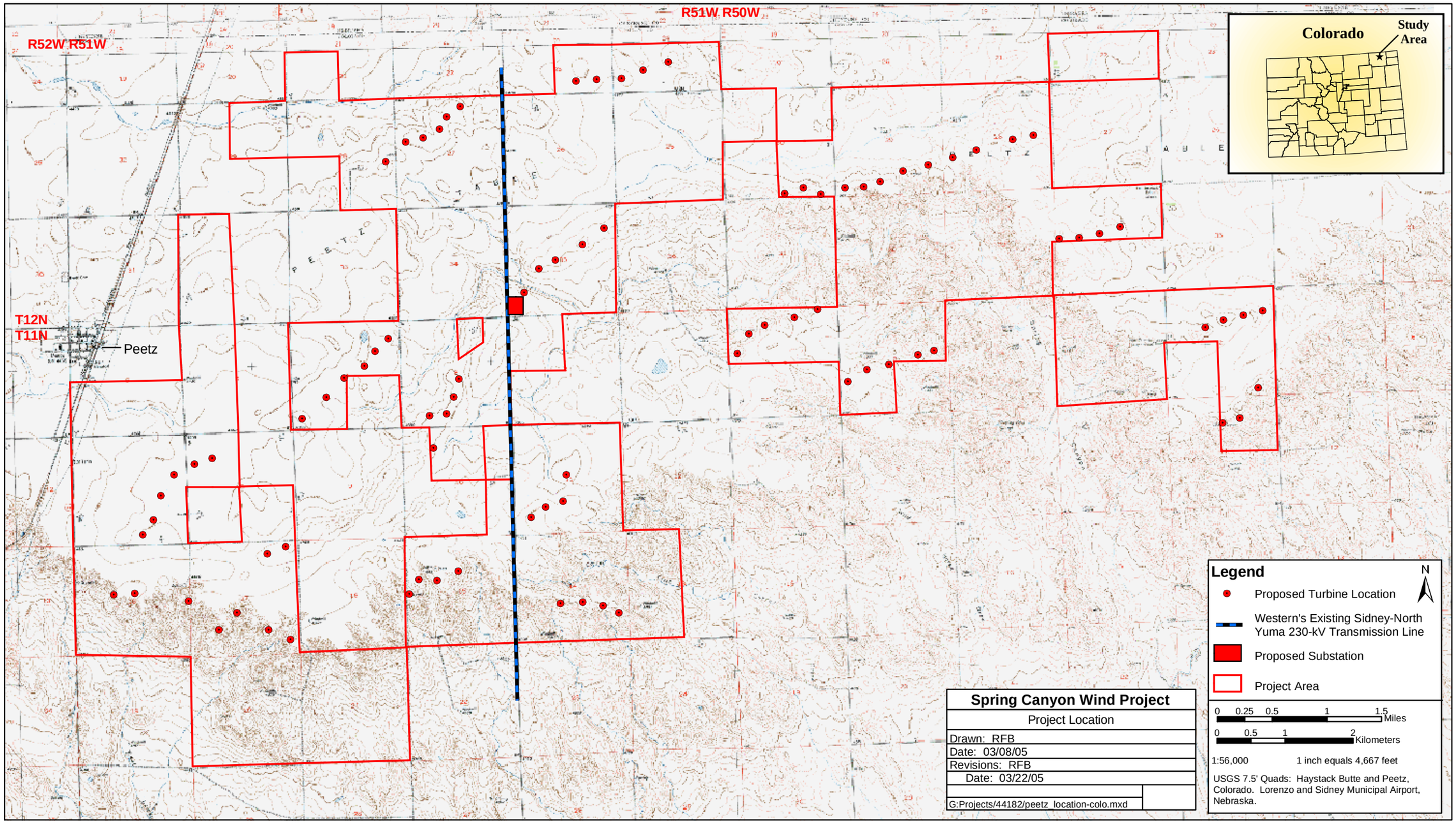


Figure F-1.1 Project Location.

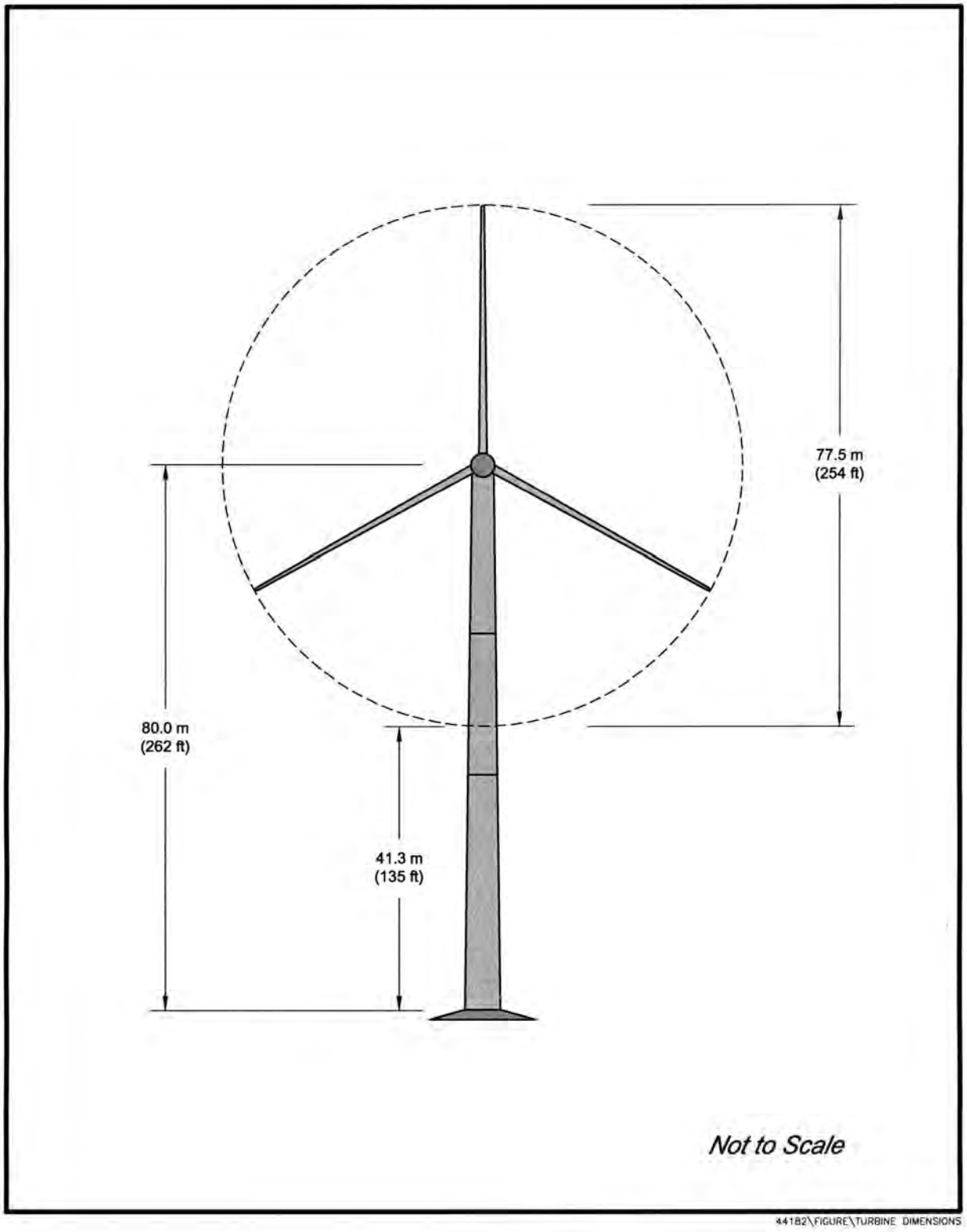


Figure F-1.2 Typical Wind Turbine.

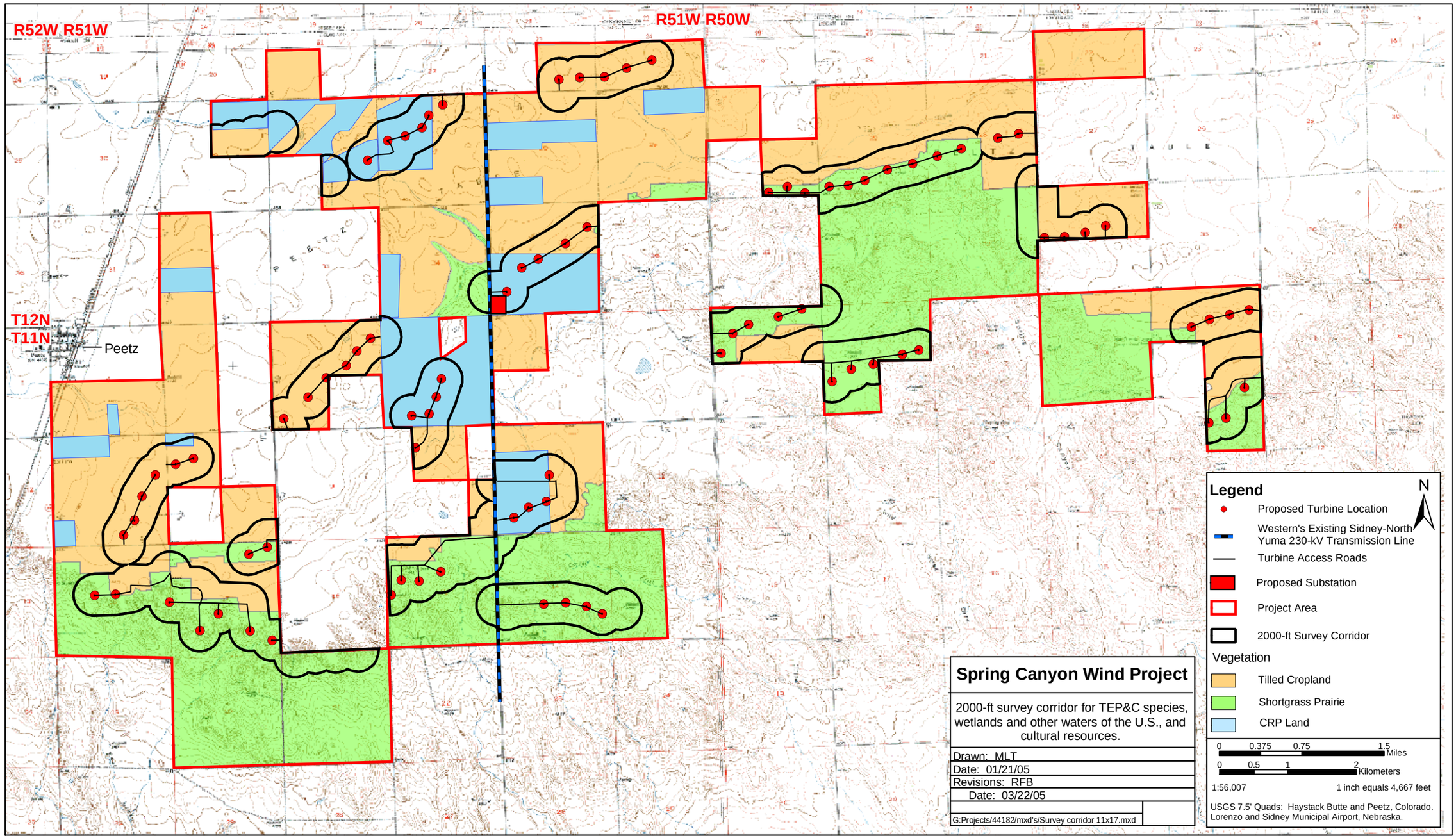


Figure F-3.1 2,000-ft Wide Survey Corridor and Vegetation.