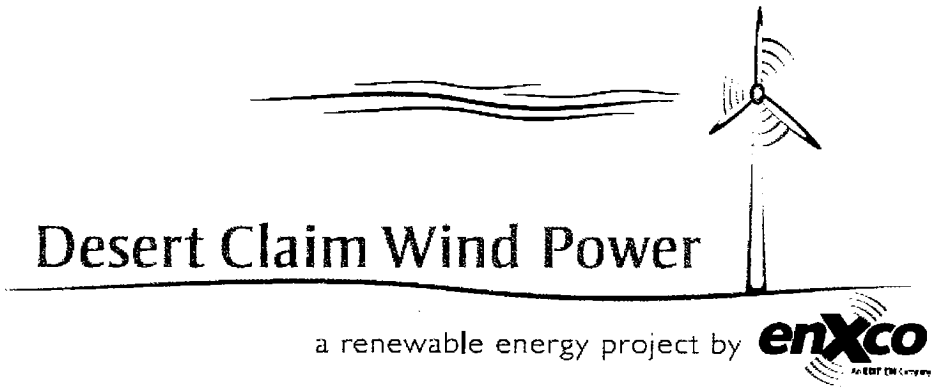
Desert Claim Wind Power

a renewable energy project by enXco

REVISED
APPLICATION FOR SITE CERTIFICATION

February 2009



January 29, 2009

Jim Luce, Chair
Energy Facility Site Evaluation Council
P.O. Box 43172
Olympia, Washington 98504-3172

Re: Revised Application for Site Certification
Desert Claim Wind Power, Application No. 2006-02

Dear Chair Luce:

Desert Claim Wind Power LLC (Desert Claim or the Applicant) hereby submits a Revised Application for Site Certification ("Revised Application"). The primary differences between the project proposal in this Revised Application and the project proposal in Desert Claim's November 2006 Application concern the Project Area and the turbine configuration. The Project Area has been modified to add land in the southwest and remove land in the northeast. This modification has allowed Desert Claim to add five more turbines while at the same time increasing the distance between proposed turbines and non-participating residences.

Reconfigured Desert Claim Project

The Revised Application describes the reconfigured Project, which now consists of 95 turbines capable of producing a total of 190 megawatts (MW) of electricity. It is located on approximately 5,200 acres in unincorporated Kittitas County, approximately eight miles northwest of the city of Ellensburg.

The Project Area now includes land to be purchased by a Desert Claim affiliate, land to be leased from four private land owners, and land to be leased from the Washington Department of Natural Resources (DNR). Unlike many wind power projects with turbines located along ridgelines, the Desert Claim Project occupies a relatively flat valley, with turbines spread throughout the project area. A 625-foot safety setback surrounds each turbine. Under the revised turbine configuration, there are only seven non-participating residences located

within 2,500 feet of a turbine. Those residences are located at distances ranging from 1,687 to 2,241 feet of the nearest turbine, distances that are more than four times the height of the turbines.

The Project will continue to use REpower MM92 model turbines, with a nameplate generating capacity of 2 MW. This turbine model has a total tip height of 410 feet (124.8 meters). The turbine tower has a height of 258 feet (78.5 meters), a rotor diameter of 304 feet (92.5 meters) and the rotors will be 106 feet (32.3 meters) above the ground when pointing straight down.

Applicant

The Applicant is Desert Claim Wind Power LLC, a Washington limited liability company that was created for the sole purpose of developing, permitting, financing, constructing and operating the Project. Desert Claim is wholly owned and managed by enXco, Inc. (enXco).

enXco is a privately-held company based in California that develops, constructs and operates commercial-scale wind energy projects. enXco has owned and operated wind energy projects in the United States for more than twenty years. It currently has approximately 1,375 MW of wind power projects in operation, and projects totaling more than 4,200 MW under development.

For purposes of WAC 463-60-025, Desert Claim continues to designate David Steeb as its agent:

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Contacts regarding the Revised Application should be directed to Mr. Steeb and the Applicant's attorney:

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Jim Luce, EFSEC Chair
January 29, 2009

Changes from the Original Project Proposal

Desert Claim filed an application with Kittitas County for the original Desert Claim Project in January 2003. Kittitas County issued a Final Environmental Impact Statement (County FEIS) in August 2004 and ultimately denied Desert Claim's application in April 2005. Prior to filing an application with EFSEC in November 2006, Desert Claim considered the issues that were raised during the County process and made several modifications to the Project. Since filing its initial Application with EFSEC, Desert Claim has been able to make additional changes to the Project.

The following is a summary of the primary changes Desert Claim has made to the Project since the Kittitas County Board of County Commissioners' decision. Some of these changes were reflected in the November 2006 Application, others are new to the Revised Application.

- The Project Area has been consolidated to one contiguous area covering 5,200 acres. The Project Area includes 3,671 acres of private land and approximately 1,529 acres of DNR land. Some northern and southeastern portions of the original Project area have been eliminated, and property has been added along the western edge.

- The total number of turbines has been reduced from 120 to 95.

- The turbine model has changed from the General Electric Wind Energy 1.5sl turbine (capacity 1.5 MW) to the REpower MM92 turbine (capacity 2.0 MW).

- There are now only 7 non-participating residences located within 2,500 feet of a proposed turbine. All are located more than four times the total tip height (4 x 410 feet) from the nearest turbine.

- Sound from the Project will be 50 dBA or less at the boundary with non-participating residential properties.

- Shadow flicker at adjacent residences has been substantially reduced, if not avoided altogether. For those residences (if any) that are affected by perceptible shadow flicker, Desert Claim has agreed to stop the blades of the wind turbine that causes the flicker during those times and conditions when shadow flicker occurs, or offer a voluntary waiver agreement to the land-owners in lieu of stopping the turbine.

- The Project will not result in any temporary or permanent impacts to wetlands, streams or their buffers.

- Daytime white strobe lighting has been eliminated and nighttime red lighting has been reduced to only 41 of the Project turbines.

A more detailed description of the Project is provided in the Project Description, which is attached at Tab 1.

Jim Luce, EFSEC Chair
January 29, 2009

Materials Supporting Application

Applications to the Council have typically been organized in a way that closely tracks the standard organization of Environmental Impact Statements prepared pursuant to the State Environmental Policy Act (SEPA) in order to facilitate the Council's preparation of an EIS. EFSEC regulations generally require this organization. *See* WAC 463-60-012. In this instance, however, Kittitas County has already published a Final EIS on the Project. Repeating the information from the County FEIS in an application would be inefficient and seems unnecessary when EFSEC can rely upon the existing SEPA document, electronic copies of which have been provided. *See* RCW 43.21C.034; WAC 197-11-600, -630.

For this reason, Desert Claim requested a waiver from the Council's prescribed organization when it filed its November 2006 Application. Desert Claim has attempted to provide the Council with materials necessary to evaluate the Project without duplicating the County FEIS. The Revised Application follows a similar organization and consists of the following materials:

Tab 1	Revised Project Description
Tab 2	New Visual Simulations
Tab 3	Regulatory Matrix (describing where information required by Council regulations can be found in the Revised Application, County FEIS or preliminary draft SEIS)
Tab 4	Revised Wetland and Stream Report
Tab 5	Revised Vegetation and Wildlife Report
Tab 6	Revised Sound Analysis
Tab 7	Turbine Hazard Analysis (a reprint of the report provided in the November 2006 Application)
Tab 8	Revised Shadow Flicker Analysis
Tab 9	Revised FAA Lighting Plan
Tab 10	Supplemental Information Required by Council Regulations

Jim Luce, EFSEC Chair
January 29, 2009

Draft SEIS

On March 19, 2007, EFSEC issued a Notice of Adoption of the County FEIS and a Notice that it would be preparing a Supplemental Environmental Impact Statement (SEIS). At the request of the Council's Manager and SEPA Responsible Official, Allen Fiksdal, Desert Claim is also providing a preliminary draft of the SEIS prepared by Richard Weinman of Weinman Consulting, LLC with the assistance of various other environmental consultants.

EFSEC Process Going Forward

Following Desert Claim's submission of its Application in November 2006, the Council began the process of considering the application outlined the Council's regulations. The Council held a public information meeting on December 13, 2006, and held a Land Use Consistency Hearing on January 30, 2007.

On March 7, 2007, the Council issued Order No. 825, finding that the Project was not consistent with Kittitas County land use requirements because Desert Claim had not obtained the approvals required by Kittitas County Code chapter 17.61A. On May 8, 2007, the Council issued Order No. 830, concluding that Desert Claim had satisfied the requirements of WAC 463-28-030(1) and could proceed to file a request for preemption. On June 29, 2007, Desert Claim filed a request for preemption.

Shortly thereafter, Desert Claim indicated to the Council that it intended to make some improvements to the Project. Those improvements are reflected in the Revised Application.

During its February 2008 meeting, pursuant to RCW 80.50.100, the Council extended the time in which to review the Desert Claim application to February 19, 2009. By this letter, Desert Claim requests that the Council further extend the time period in which to review the application until December 31, 2009.

With the filing of this Revised Application, Desert Claim asks the Council to resume the EFSEC process by issuing a Draft SEIS, commencing the adjudicatory process, and establishing a deadline before which interested persons may file motions to intervene in the proceedings. We look forward to the Council's evaluation of the Desert Claim Project.

Sincerely,

David Steeb
Project Director

Desert Claim Wind Power

Revised
Project Description

January 2009

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1. INTRODUCTION

This revised Project Description is part of the Revised Application for Site Certification (Revised Application) for the reconfigured Desert Claim Wind Power Project (the Project). The Project is a renewable wind energy generation facility that will consist of up to 95 wind turbines and have a nameplate capacity of up to 190 megawatts (MW). The Project will be located in unincorporated Kittitas County, approximately 8 miles northwest of Ellensburg, Washington **(Figure 1)**.

Desert Claim Wind Power LLC (Desert Claim or the Applicant) originally applied to Kittitas County for the land use approvals and permits necessary to construct and operate an earlier version of the Project. Kittitas County evaluated the environmental impacts associated with the original project proposal in a Final Environmental Impact Statement published in August 2004 (County FEIS). The Kittitas County Board of County Commissioners ultimately denied Desert Claim's application. Following the County's decision, Desert Claim made significant modifications to the Project to further reduce potential impacts and to respond to feedback from Kittitas County and its residents. These modifications were reflected in the original Application for Site Certification filed with EFSEC in November 2006. Since then, Desert Claim has obtained development rights to additional property and has made further modifications to the Project to significantly reduce impacts to nearby non-participating residences.

This Project Description includes the following sections. **Section 2** identifies the Project site and describes the existing conditions at that site. **Section 3** describes the facilities that will comprise the completed Project. **Section 4** addresses the construction process. **Section 5** addresses operation and maintenance. **Section 6** summarizes mitigation measures that have been incorporated in the Project. **Section 7** addresses provisions for future decommissioning of the Project. **Section 8** contains a list of cited references. All figures are grouped together at the end of the Project Description.

Many of the topics addressed in this Project Description are discussed in greater detail in the County FEIS, an electronic copy of which was provided with the November 2006 Application. This Project Description highlights the revisions that have been made in the Project since it was considered by Kittitas County from 2003 to 2005. The following are the most significant of those changes:

- The Project Area has been consolidated from four separate parcels to one contiguous area. The Project Area now consists of approximately 5,200 acres, of which approximately 3,671 acres are privately owned and approximately 1,529 acres are owned by the Washington Department of Natural Resources (WDNR).

- The number of turbines has been reduced by 20%, from 120 to 95.

- The turbine model has changed from the 1.5 MW General Electric Wind Energy 1.5sl turbine to the 2.0 MW REpower MM92 turbine.

- The turbine configuration has been revised so that there are now only 7 non-participating residences located within 2,500 feet of a proposed turbine. All non-participating residences are located more than 1,640 feet (four times the turbine tip height) from a proposed turbine, with the closest residence located 1,687 feet from a proposed turbine.

- Sound from the Project will be 50 dBA or less at the boundary with non-participating residential properties.

- Shadow flicker at adjacent non-participating residences has been substantially reduced, if not avoided altogether. For those residences (if any) that are still affected by perceptible shadow flicker, Desert Claim will stop the blades of the wind turbine causing the flicker during those times and conditions when shadow flicker occurs, or offer a voluntary waiver agreement to the landowners in lieu of stopping the turbine.

- The Project will not result in any temporary or permanent impacts to wetlands, streams or specified buffers.

- Daytime white strobe lighting has been eliminated and nighttime red lighting has been reduced to forty-one of the Project turbines.

2. EXISTING PROJECT SITE CONDITIONS

The revised Project Area is shown in **Figure 2**. It contains a total of approximately 5,200 acres. Approximately 3,671 acres are owned by five private landowners and 1,529 acres are owned by WDNR, all of whom have signed agreements authorizing the Applicant to seek permits to construct and operate the Project on their lands.

The southern edge of the Project Area is located approximately 8 miles north of the central part of Ellensburg. The Project Area extends approximately 4.0 miles from west to east and up to 3.5 miles in a north-to-south direction. The southwestern corner of the Project Area is ½ mile east of U.S. Route 97 and can be accessed from U.S. Route 97 via Smithson Road. Access to the Project Area from Ellensburg can be via Wilson Creek Road, Robbins Road, Pheasant Lane, Reecer Creek Road or Lower Green Canyon Road.

2.1 Physical Setting

The Project Area is situated along the northern margin of the Kittitas Valley, which is the broad valley area of central Kittitas County on either side of the Yakima River between Lookout Mountain and the Yakima Canyon. Unlike many wind projects that consist of turbine strings located along high ridgelines, the Desert Claim Project is generally spread out over the rising valley floor. The terrain within the Project Area is relatively flat and open, with a gradual south-to-north rise in elevation totaling approximately 400 feet over a distance of approximately three and a half miles. Surface elevations range from approximately 2,100 feet to 2,500 feet above sea

level across most of the Project Area. The northernmost portion of the Project Area lies within the foothills of the Wenatchee Mountains (a portion of the Cascade mountain range). The highest elevations and steepest slopes in the Project Area are in Township 19N, Range 18E, Section 9.

Geologically, the Project Area is located on a broad alluvial fan at the base of the mountains. The alluvial fan is a gently sloping area built up by soils carried down and deposited over millennia by water generated by receding glaciers that at one time covered the mountainous area to the north. Several small, gently sloping creeks flow generally north to south across the Project Area, forming shallow depressions across the otherwise even landscape.

The Kittitas Valley has an arid to semi-arid climate, with annual precipitation in Ellensburg averaging 8.5 inches per year (Kittitas County Conservation District 2003). Some patches of native shrub-steppe or grassland vegetation remain, particularly around the outer edges of the valley, while the existing vegetative cover in most of the valley is dominated by agricultural cultivation and landscape plantings.

2.2 Wind Resource

The climate of the Kittitas Valley is strongly influenced by surrounding mountainous terrain and air masses traveling to the east from the Pacific Ocean towards central and eastern Washington. The Cascade Mountains form a north-south topographic and climatic barrier influencing prevailing wind direction, temperatures and precipitation. Cooling and condensation occur as air rises over the western slope of the Cascades, producing heavy precipitation in the mountains. As the air masses descend along the eastern slope they become warmer and drier, however, producing lighter precipitation and consistent winds in the Kittitas Valley. Prevailing local winds are generally from the west to northwest and are strongest in the spring and summer. The wind speed in Ellensburg averages approximately 4.8 meters/second (m/s) (11 miles per hour (mph)) for the year, with seasonal averages of over 6 m/s (13 mph) for the spring and nearly 7 m/s (16 mph) in the summer (NREL 2003). **Figure 3** illustrates prevailing wind patterns for the Project Area.

Publicly available wind resource maps characterize the Project Area and surrounding lands as an area of Class 4 (Good) wind resource, with typical wind speeds at a height of 164 feet (50 meters) averaging 15.7 to 16.8 mph (Northwest Sustainable Energy for Economic Development, 2003). Average wind speeds of at least 13 mph are currently considered to be the minimum requirement for economic utility-scale wind power plants (AWEA 2003). The desired baseline criterion for feasible, utility-scale wind power production (depending on the model of turbine selected) is a wind speed of 13 to 15 mph at least 30 percent of the time annually. However, these thresholds being lowered as utilities and the public continue to desire more renewable wind power.

The Applicant collected meteorological (met) data at multiple sites within Kittitas County beginning in 2001, as part of its resource exploration studies. Six temporary met towers were erected in several locations. Each tower was equipped with several anemometers to measure wind speed, a wind vane to measure wind direction and a temperature sensor. All of the

instruments provided site data to loggers that recorded the observed data. The met data collected over the past seven years confirm that there is a sufficient commercial wind resource for power generation in the proposed Project Area.

2.3 Land Ownership and Use

2.3.1 Land Ownership

The Project Area consists of all or portions of the following sections in Township 19N, Range 18E, Sections 9, 16, 17, 18, 19, 20, 21, 22, 27, 29 and 30 along with the NW corner of Township 19N, Range 17E, Section 25.

Of the 5,200 acres of land within the Project Area, 2,551 acres will be leased from four private landowners, 1,529 acres will be leased from WDNR and 1,120 will be owned by an enXco affiliate. The following rights-of-way easements cross the Project Area:

- Bonneville Power Administration (BPA) maintains five electrical transmission lines that cross the Project Area;
- Puget Sound Energy (PSE) maintains one transmission line that crosses the Project Area;
- Kittitas County Public Utility District (PUD) maintains the electrical distribution system that serves the Project Area and vicinity; and
- Kittitas County maintains the county roads within and adjacent to the Project Area.

2.3.2 Land Use

The Project Area is in a rural, relatively lightly populated area of Kittitas County and is characterized primarily by agricultural uses. Much of the land within and surrounding the Project Area is cultivated for feed crop production or pasture. Extensive areas of rangeland are used for grazing. Rural residential development occurs in a number of locations, including dwellings on farm or ranch properties, scattered residences on large lots, and a few small clusters of homes.

There are nine residences located within 2,500 feet of a proposed turbine. Of these, two are residences of participating property owners. **Table 1** indicates the distance from each of the non-participating residences to the nearest proposed turbine. **Figure 4** shows the locations of these residences.

Table 1
Nearby Non-Participating Residences
and Distances from Nearest Proposed Turbine

Residence Number (See Figure 4)	Distance to Nearest Proposed Turbine
1	1,778 feet
2	2,241 feet
3	1,687 feet
4	1,694 feet
5	1,915 feet
6	1,789 feet
7	1,856 feet

The Project Area is within a major cross-state electrical transmission corridor that links hydroelectric dams on the Columbia River with the large power consumer market of western Washington. Six high-voltage transmission lines cross the Project Area; five are owned and operated by BPA and one by PSE. A BPA regional substation is located on a 133-acre parcel two and a half miles east of the Project Area.

The Kittitas Reclamation District North Branch Canal, which provides irrigation water for much of the northern part of the Kittitas Valley, traverses east to west in the vicinity of Smithson Road, generally along or near the southern edge of the Project Area. Most irrigated agriculture occurs downhill and south of the canal and the Project Area.

Wenatchee National Forest lands north of the Project Area are used for recreation, grazing and commercial forestry. Recreational activities include camping, hiking, horseback riding, mountain biking, off-road vehicle use, hunting, snowmobiling and cross-country skiing. Members of the Yakama Nation hunt, gather plants, and conduct other traditional activities in the vicinity of the Project Area, pursuant to reserved treaty rights applicable to ceded lands. The private lands of the Project Area are not open to general public use. Some low-intensity outdoor recreational uses, including hunting, horseback riding, snowmobiling and off-road vehicle use, occur with the permission of individual landowners.

Under the Kittitas County Code, the land within the Project Area is zoned either Ag-20 (agricultural use, with a 20-acre minimum parcel size) or Forest & Range (allowing residential development with a minimum of 20 acres per dwelling). The entire Project Area and the adjacent lands are within a large area designated as Rural in the Kittitas County Comprehensive Plan.

3. PROJECT FACILITIES

Wind energy projects consist of several types of facilities, including the wind turbines themselves, power collection, substation and transmission facilities, access roads, and an operations and maintenance facility. Each component is described below, based on the Project planning information available at this stage.

3.1 Wind Turbines

The revised Project includes a maximum of 95 wind turbines. The term "turbine" refers to the entire structure that produces electricity. Each turbine consists of three rotor blades connected at the rotor hub, a nacelle (the housing for the generator, which is connected via a gear box and rotor to the blades), and a tubular tower anchored to a tower foundation. Each of these turbine components is discussed below. **Figure 5** is a photograph of typical wind turbines currently in use.

The Applicant proposes to use the REpower MM92 turbine in this Project. The REpower MM92 has a 2.0 MW nameplate generation capacity. It has a total height from the ground to the blade tip point straight up of 410 feet (124.8 meters). Each tower (measured to the rotor hub) is 258 feet (78.5 meters) tall, and the rotor blades have a 304 feet (92.5 meters) diameter and will be 106 feet (32.3 meters) above the ground when pointing straight down. This model of turbine is slightly taller than the General Electric turbines proposed for this Project during the County permitting process. **Figure 6** illustrates the typical turbine that will be used for the Project.

3.1.1 Towers

Tubular steel towers will support the nacelle, rotor and blades. The purpose of the tower is to position the turbine blades high enough to intercept winds that are stronger than those near the ground surface, and to avoid wind turbulence that might be created by nearby trees, buildings, terrain or other obstructions (National Wind Coordinating Committee 2002). Each tower will be a maximum of 258 feet (78.5 meters) in turbine hub height. The tower will have a diameter of approximately 14 feet at the base, tapering at the top of the structure. When fully assembled, each tower will weigh approximately 160 tons. The heavy, rolled steel forming the tower structure will have a smooth exterior surface. The turbine towers will be painted a neutral color as directed by the FAA.

A locked steel door will provide secured access to the base of each tower. A locked, computerized control cabinet will be located inside the tower at the base. Cables and a steel ladder will extend within the hollow tower interior from the tower base to the nacelle, to provide access for turbine maintenance.

3.1.2 Foundations

The freestanding, tubular towers will sit atop steel and concrete foundations designed for the specific subsurface conditions at the individual turbine sites. There are two industry-standard foundation designs that could be used in the Project. These are depicted in **Figures 7A** and **7B**.

Figure 7A illustrates an inverted T foundation, which employs a relatively shallow concrete base with a relatively large diameter. The maximum depth of the base will be about 8 feet below the ground surface and the diameter will be up to 80 feet. The turbine tower will be anchored to the foundation base by a base plate ring consisting of long, steel bolts extending nearly to the bottom of the concrete base.

The second type of foundation is a pile foundation. **Figure 7B** provides a cross-section view. A cylindrical culvert is used to anchor the tower base. Inner and outer sections of culvert pipe of slightly different diameter are sunk into an excavation that will range from 25 to 35 feet in depth, depending on specific subsurface conditions, and are backfilled with compacted soil. Two parallel rings of full-length steel anchor bolts extend from the tower base plate through the culvert section, which is filled with concrete after installation of the bolts.

A registered engineer will select the appropriate foundation design for each turbine location based on site-specific information of geotechnical conditions present, advice on load-bearing capacities from a geotechnical engineer, and the design engineer's recommendations. The foundation designs will conform to State and County requirements and standard industry practices. A Washington registered engineer will review and approve all foundation designs.

3.1.3 Nacelle and Rotors

The nacelle is the rectangular housing that covers the operating mechanism of the turbine. Each nacelle will be approximately 35 feet long, 10 feet wide and 13 feet high. The exterior surface will be constructed of fiberglass lined with sound-absorbing foam. The generator, gear box and associated control equipment for the turbine will be housed inside the shell of the nacelle (see **Figure 8**). The nacelle will be accessed internally through the tower, and most servicing of the machinery will be conducted within the nacelle in order to protect the equipment and the workers from the elements.

The rotor assembly for each turbine will include three blades, and will be attached to the front of the nacelle at the hub. The Project will use an upwind turbine design, in which the nacelle is turned into the wind to place the generator and tower behind the blades. The blades will be composed of laminated fiberglass or a fiberglass composite, and will have a smooth outer surface. Each blade will be fabricated offsite in one piece, transported to the Project site, and then bolted to the rotor hub, raised into position by crane and connected to the nacelle.

The equipment inside the nacelle will include electrical motors used to turn the nacelle and rotors into the wind, and to control the pitch of the rotor blades, and an automatic braking system. The pitch of the rotor blades will be controlled by a computer that will rotate them continually on

their axis to maintain the optimum angle to the wind to maximize generation output at a given wind direction and speed. At wind speeds above the maximum safety threshold of 54 mph, the blades will be rotated into a feathered position and the braking system will stop the rotor from turning. After 10 minutes and when the wind speed reduces to below 54 mph, the blades will rotate their pitch into the wind and start turning again.

The control system can be programmed to stop the blades of a specific turbine during those times and conditions (if any) when that turbine causes perceptible shadow flicker at a nearby residence. The owners of the affected residence may elect to execute a voluntary waiver agreement with the Applicant in lieu of stopping the turbine affecting their residence.

3.1.4 Turbine Locations

A maximum of 95 turbines will be installed within the Project Area, distributed across the Project site as shown in **Figure 4**. The turbine placement plan was determined using computerized modeling software that incorporated the field-verified residence data, stream setbacks and wetland buffers, the performance-based safety zone setback and wind resource considerations from metrological data collected in the Project Area, long-term weather data, Project Area topography and environmental factors such as stream setbacks, wetland buffers, and the State noise standards. The objective of the turbine location plan is to provide each turbine with optimum exposure to wind from all directions, with emphasis on exposure to the prevailing northwesterly wind direction. Sufficient spacing was established between wind turbine towers to minimize array and wake losses (i.e., energy losses created by turbulence between and among the turbines). Turbines may be micro-sited (re-located by up to 300 feet) at each location during the pre-construction detailed site design to maintain stipulated siting requirements, and/or during construction to avoid cultural resources or environmental features that become apparent during construction activities.

The distribution of turbines for the Project differs from what is often seen at wind energy projects. Many wind projects locate turbines in long strings along high ridge tops. Unlike many locations where winds are strongest along ridge tops, winds in the Project vicinity typically come out of the northwest from the upper valley, after funneling through passes in the Cascade Mountains, and spread out on the lower, flat portion of the northern Kittitas Valley. The Project will locate turbines over a broad plain in response to this wind pattern.

The turbine layout incorporates a minimum 625-foot safety zone setback from all buildings, Project Area boundaries,[1] public roads and utility transmission corridors. This safety setback is designed to ensure protection against potential mechanical failures and hazards, such as blade throw, ice throw and tower collapse (KPFF Consulting Engineers 2006). The previous application to Kittitas County that was analyzed in the County FEIS used a 487-foot safety setback because the proposed turbine model was smaller.

[1] There is one exception to this general rule. In the southwest portion of the Project Area, turbines may be located closer than 625 feet from the Project Area boundary, but the adjacent participating property owner has agreed to maintain the safety setback from all buildings.

3.2 Project Electrical System

The electrical system for the Project will consist of three primary components: the power collection system, a Project substation and an interconnection to the regional power transmission grid. The function of the electrical system will be to collect the electricity produced by the Project turbines and convert it to higher-voltage electricity to be fed into the regional power system.

3.2.1 Power Collection System

The power collection system has been configured to avoid sensitive environmental features, especially streams and wetlands. Power collection cables have been placed underground or on road water crossing structures except, in limited cases, where it is not reasonably feasible to do so.

The generator housed in the nacelle of each turbine will produce electricity at 575 volts. Low-voltage cables located inside the tower will carry the electricity from the nacelle through the tower to a transformer mounted on a concrete pad adjacent to the base of each tower. The pad will be approximately 8 to 9 feet square and 1 foot thick. The transformer will occupy almost the entire area of the concrete pad and will be approximately 5 feet high. The transformer will raise the voltage from 575 volts to 34.5 kilovolts (kV).

Electricity will be carried underground from the transformer into a 34.5-kV power cable installed as part of the power collection system. The network of power collection cables will connect the 95 turbines to the Project substation. Junction boxes that merge multiple incoming cables into one outgoing line will be installed at various locations within the Project Area to facilitate the collection of power from turbines. **Figure 9** illustrates the expected layout of the power collection system.

Power collection cables will be placed underground except where it is not reasonable to do so based on site-specific physical conditions (i.e., where it will be less disruptive to sensitive environmental features to place the cables above ground, or where steep and/or rocky terrain favored the use of overhead cable). Underground cables will be installed in trenches or plowed-in at a depth of 4 feet below the ground surface. At stream crossings, the cables may be located on the road bridge or structure. In certain areas, the underground cables may be encased in concrete to provide additional protection and stability in the ground.

Overall, the collection system is estimated to contain approximately 27 lineal miles of underground cable, of which approximately 25.5 miles will be laid as part of the Project road system to reduce impacts to the land surface. Power collection lines will be located within the properties that comprise the Project Area except for those portions that will be bored or trenched under County roads to connect parcels on either side of the County road.

3.2.2 Substation

An electrical substation will be needed to provide a further increase or step-up in voltage for the power collected from the Project turbines. Two alternative substation locations are shown on **Figure 9.** The first is located near the southwestern corner of Section 16, Township 19N, Range 18E, approximately 1 mile north of Reecer Creek Road. This location abuts the PSE Rocky Reach-Cascade 230 kV transmission line that crosses the Project Area. The alternative substation is located on the western portion of Section 19, Township 19N, Range 18E along the BPA transmission lines. The final selection of the substation location will be made after the interconnection point has been determined with the transmission system owner and the utility purchasing the power generated by the Project.

One or more large power transformers located within the Project substation will step-up or raise the voltage of the electricity flowing from the Project power collection system to meet the higher voltage of the receiving electrical transmission line. Substation equipment will include power transformer(s), disconnect switches, and metering relays. The substation will include a small building that will house the power generation control and relaying equipment, station batteries, and the supervisory control and data acquisition (SCADA) system. The entire substation area will be cleared, graded and covered with gravel, and will be surrounded by a chain-link fence. The completed substation will occupy approximately 2 acres. The substation will be designed to meet the standards of the National Electric Safety Code and the requirements of the entity operating the receiving transmission line.

3.2.3 Transmission Interconnection

An overhead transmission line will connect the Project substation with one of the high-voltage electrical transmission lines that cross the Project Area. The Applicant has not yet negotiated a power sale agreement or completed an interconnection agreement, but has identified options for interconnecting the Project to the regional transmission network. Existing regional transmission lines located on the Project Area include the following:

- BPA operates five transmission lines, at voltages ranging from 230 kV to 500 kV, within a major corridor that extends west from the Columbia River hydroelectric system and essentially bisects the Project Area.

- PSE's Rocky Reach-Cascade 230 kV line follows a generally east-to-west path through the Project Area north of the BPA lines.

The interconnection line would be no longer than approximately 100 to 200 feet for a connection to the PSE line or BPA lines within the Project Area.

3.3 Meteorological Towers

Four temporary met towers are currently installed in the Project Area. Project development typically involves the use of temporary met towers during the exploration and design phases. Temporary met towers are usually slender, tubular aluminum structures that are secured by multiple guy wires that extend up to 110 feet from the tower base.

Permanent met towers are standard features of utility-scale wind power projects. These towers will be self-supporting steel structures with concrete foundations. **Figure 10** is a drawing of a typical permanent met tower. The towers will have multiple anemometers to measure wind speed and direction at different elevations, and will be placed at strategic locations that best support automated control of the turbine operations. The Applicant proposes to construct up to four permanent met towers. They will be approximately 212 feet (65 meters) tall, free-standing rather than secured by guy wires, and set on concrete bases.

3.4 Access Roads

Road access to the Project Area is currently provided by a number of existing public roads. Kittitas County roads that cross or pass adjacent to parcels within the Project Area include Smithson Road, Reecer Creek Road, Pheasant Lane and Lower Green Canyon Road.

The Project will include a system of Project roads providing access to all 95 turbines, the substation and other key facilities. The proposed access road system is approximately 27 miles in length and is shown in **Figure 11**. The Project roads will connect with the existing public road system at a number of locations including six points along various sections of Reecer Creek Road; and three points on Pheasant Lane.

The Project access roads will be single-lane roads with a 15-foot travel surface width for straight sections and up to a 20-foot travel surface width for curved sections. Project access roads will have a compacted gravel surface. **Figure 12** shows a typical cross-section for the access roads. Stream crossing structures are incorporated into the Project access road system to allow for crossing of wetlands and streams, including any buffers.

Detailed plans for the Project road system and the connections to county roads will be prepared following micro-siting of the turbines. Project access road connections to county roads will be designed pursuant to County road ingress and egress standards.

3.5 Operation and Maintenance Facility

The proposed Project facilities include a permanent building to support ongoing operations and maintenance (O&M) activities. The O&M building will include an enclosed bay for storage of equipment, parts and supplies; a workshop; an office for administration and monitoring of the facility; restroom and kitchen facilities; and parking for vehicles. The enclosed space needed for

the O&M building is approximately 5,000 square feet, and the overall footprint, including parking and outside storage, will be up to 2 acres.

The O&M facility will be located one mile north of the intersection of Reecer Creek Road and Pheasant Lane. Domestic water for the O&M facility at this location will either be acquired from the landowner or obtained by developing an exempt well. Water consumption will be considerably less than 5,000 gallons per day. Restroom and kitchen facilities will drain into an on-site septic system. The O&M facility will be surrounded by a fenced enclosure with a locked gate.

3.6 Safety and Control Systems

The Project will include a communication system for monitoring and controlling the turbines. The communication system will use either copper lines, similar to telephone lines, or fiber-optic lines. Communication lines typically run to each turbine, parallel to the low- and medium-voltage power collection lines. The communication lines will be either underground or overhead on poles. In the latter case, both types of lines are thin and not highly visible. The rotor control and braking system will be a key component of the Project safety systems.

Aircraft safety lighting will be installed on the exterior of some nacelles, to comply with Federal Aviation Administration (FAA) rules for structure lighting. Specific requirements for the Project will be developed in conjunction with the FAA, based on the turbine heights and site-specific conditions. Under the Project's lighting plan, 41 of the total 95 turbines will be equipped with synchronized low-intensity flashing red lights (L-864) for nighttime use. Experience with FAA reviews of prior lighting plans indicates this configuration should meet the FAA requirements (Chavkin 2008).

Each wind turbine, including the rotor blades, will be equipped with a lightning protection system, which will be connected to an underground grounding arrangement to facilitate lightning flow safely to the ground. All equipment, cables, and structures comprising the wind turbines will be connected to a metallic, Project-wide grounding network.

Turbine towers will be locked, and the substation will be fenced and locked to prevent unauthorized entry.

3.7 Visitor Facilities

Desert Claim is willing to develop visitor facilities to accommodate public interest in the Project if EFSEC believes these facilities would be desirable. If so, the facilities would likely consist of a roadside turnout adjacent to a County road at a location providing a suitable view of Project wind turbines, with an information kiosk and appropriate signage. A tentative site for the visitor facilities is shown on **Figure 4**, near the junction of Reecer Creek Road and Lower Green Canyon Road within the Project Area.

4. CONSTRUCTION PROCESS

Construction of the Project will involve standard construction procedures typically used for wind energy projects in the Northwest. The Project Area has relatively flat or gently sloping terrain and good drainage, so it is suitable for the construction of roads and turbine foundations. This section summarizes the schedule and general sequence for the construction process, and describes procedures to be used for construction of the various Project components.

4.1 Schedule and General Sequence

The construction process will be completed over an approximately 9-month period. The primary tasks in the construction process are:

- survey and stake Project facility locations;
- construct Project access roads and turbine pads;
- construct foundations for towers;
- excavate trenches for underground utilities;
- place underground power collection and communication cables in trenches;
- construct overhead power collection and communication cables and interconnection with the BPA or PSE transmission line;
- construct the Project substation;
- construct the Project operation and maintenance facility;
- transport tower sections to the site and assemble towers;
- assemble and install nacelles, rotors and other turbine equipment;
- install safety and control systems;
- test all Project systems; and
- conduct final site grading, reclamation and cleanup.

Habitat, sensitive areas and cultural protection areas within the Project Area will be delineated, defined in contracting documents and marked in the field, pursuant to consultations with Washington Department of Fish and Wildlife (WDFW) personnel.

In general, the first few months of construction activity will involve initial civil and electrical construction, including construction of the Project access roads and tower foundations, the power collection system and communication lines, and the Project substation. Tower installation will be accomplished in phases. As Project access roads and tower foundations are completed, turbines will be erected. Installation of the nacelles, rotors and associated equipment will be the final task of major construction activity for each turbine. The Applicant expects to begin commercial operation within one month after commissioning the first wind turbine.

4.2 Construction Equipment and Space Requirements

Constructing the Project will require the use of various types of construction equipment. **Table 2** summarizes the types and functions of construction equipment that are typically used in the construction of commercial wind energy projects.

Table 2
Typical Construction Equipment for Wind Energy Projects

Equipment	Use
Bulldozer	Road and pad construction, substation, O&M facility, construction staging areas
Grader	Road and pad construction, substation, O&M facility, construction staging areas
Water trucks	Compaction, erosion and dust control
Roller/compactor	Road and pad compaction
Loader	Loading/unloading/moving construction materials
Backhoe/trenching machine	Excavating trenches for underground utilities
Truck-mounted drilling rig, augur	Drilling tower foundations, holes for power poles
Concrete trucks and pumps	Pouring tower and other structure foundations
Cranes	Erecting towers, nacelles and rotors
Dump trucks	Hauling road and pad construction materials
Flatbed trucks	Hauling towers, blades and other equipment
Pickup trucks	General use and hauling minor equipment
Small hydraulic cranes/forklifts	Loading and unloading equipment
Rough terrain forklift	Lifting equipment
Truck-mounted high reach	Aerial framing and clipping
Truck-mounted tensioner and cable reels	Stringing power collection/transmission lines
Winch truck	Realign power collection/transmission structures
Construction Cranes	Off-loading and erecting towers, nacelles, blades

Source: BPA 2001

Construction activities will require temporary disturbance of a larger area than will be occupied by the permanent Project facilities. **Table 3** identifies the estimated area that will be disturbed in construction and within the permanent footprint of the various Project components.

Table 3
Estimated Area of Construction Disturbance and Permanent Facilities

Project Feature	Temporary Construction Disturbance (acres)	Permanent Project Footprint (acres)
Wind Turbine Pads	98.6	10.5
Internal Power Collection System [1]	3.8	0.1
Project Substation	2.8	2.0
Kiosk Area	1.0	0.3
Met Towers	0.4	0.1
Project Access Roads [2]	188.2	71.5
Project O&M Facility	2.8	2.0
Construction Staging/Storage	19.5	-
Total Area	317.2	86.4
Percent of Project Area	6.1%	1.6%

[1] Power collection system within Project Area (under ground) with 85 percent contained within access road areas.

[2] Area for Project access roads increased 15 percent to include curves and intersections to non-Project roads.

4.3 Work Force

Approximately 120 to 165 people will likely be employed at some time during Project construction. Some of these workers will be employees of Desert Claim or enXco, Inc., but most will work for various construction contractors and equipment vendors who will provide construction goods and services to the Project. The size of the construction work force present at any given time will vary with the schedule of tasks in the construction process. Relatively few construction workers will be present during the initial and final stages of construction activity, for example. The road/pad and tower foundation construction tasks are likely to be the Project activities with the greatest labor requirements.

The Applicant will use local construction contractors and suppliers to the extent possible. Based on experience with other wind energy projects in the Northwest, it is likely that local firms and workers will be available for tasks such as surveying, site clearing and grading, road and turbine foundation construction, and site restoration/cleanup. Tasks such as transmission line and substation construction, turbine assembly, installing safety and control systems, and testing require more specialized skills that are less likely to be available locally, and therefore, may be performed by non-local firms and workers.

4.4 Erosion and Sedimentation Control

Erosion and sedimentation control will be standard practice during active construction and during the restoration and cleanup stage of the construction process. The Applicant will develop and implement of a Temporary Erosion and Sedimentation Control Plan (TESCP). This design-level plan will prescribe the use of Best Management Practices that are standard features of such plans. The Project TESCP will be based on and comply with the Washington Department of Ecology's *Stormwater Management Manual for Eastern Washington.* The TESCP will also address the erosion control and water quality conditions of the National Pollutant Discharge Elimination System (NPDES) construction stormwater discharge general permit.

Based on the applicable standards, the TESCP will include using coverings for exposed soils (e.g., straw, jute netting, or soil stabilizers), stormwater detention ponds, sediment control basins and traps, and other well-established measures. Surface water runoff will be directed away from cut-and-fill slopes and other disturbed areas, and into ditches that drain to natural drainage features. Exposed areas will be re-vegetated as soon as possible following completion of the corresponding construction task.

Erosion and sedimentation control measures will be implemented at the beginning of the construction process, following the survey and staking task. Areas of native shrub-steppe habitat and other environmental features to be avoided will also be marked at this time. Provisions for restoration of temporarily disturbed areas will be determined through consultations with WDFW and EFSEC.

4.5 Roads and Turbine Pads

Heavy construction activity for the Project will start with clearing and grading for the Project access roads and turbine pads. In some locations, existing private farm roads will be used as segments of the Project access road system. These existing road segments will be improved as necessary to comply with the design standards for the Project roads. Improvement activities could include grading to modify the road geometry, filling in low spots, replacing culverts and other drainage features, replacing cattle guards as needed, and applying new gravel to the road surface. Improvements to existing roads will be coordinated with the landowners to minimize crop damage and ensure suitable access for the landowners.

New graveled roads will be constructed in areas where existing roads could not be used for access to the turbines. These roads will vary in width; having 15-foot travel surface widths for straight sections and 20-foot travel surface widths for curved sections. Project access roads will have turnouts at the turbine pads and other selected locations. Stream crossing structures will be incorporated into the Project access road system to allow for crossing of wetlands and streams, including any buffers. The temporary disturbance area along the Project access road routes is assumed to be approximately 35 to 50 feet wide under typical circumstances, with a wider area needed in locations where cuts and fills are required to construct and stabilize roads on slopes. The temporary disturbance width along the access roads will also accommodate trenching for Project utility lines and will accommodate access for cranes needed to erect the turbines.

Temporary construction disturbance around the turbine pads is assumed to occupy an area of about 1 acre per turbine.

Topsoil removed during grading for access road and turbine pad construction will be stockpiled onsite adjacent to the disturbed areas. The removed topsoil will be re-spread in cut-and-fill slopes, and these areas will be re-vegetated as soon as possible after road construction was completed. No offsite deposition of excavated material will be needed. Once grading for the roads and pads in a given sector of the Project had been completed, fill materials (gravel, soil and sand) needed for road and pad bases and road surfaces will be hauled to the construction site, deposited, graded and compacted as needed. Native materials from the Project Area will be used to the greatest extent possible to meet fill material needs and achieve a cut-and-fill balance within the Project Area. If fill must be imported, gravel and/or crushed rock provided by local permitted sources will be used. Quantities of filling and grading for the Project have not yet been estimated because they are dependent on the mix of tower foundations to be used, and the type of foundation for each of the 95 turbine locations will be determined based on site-specific geotechnical investigation. These quantities will be estimated after the type of tower foundation is determined for each turbine. Based on information developed for other wind energy projects of a comparable scale, however, the total volume of cut and fill quantities for the Project could be in the range of approximately 250,000 to 300,000 cubic yards. Gravel and other construction materials purchased by the road construction contractor from existing, permitted local sources will be trucked to the construction site via public roads.

4.6 Staging Areas

Temporary laydown or staging areas will be established in the Project Area to support various construction functions. These include temporary storage of tower sections, nacelles and other turbine components; temporary storage of other equipment and supplies; parking of construction vehicles and equipment; parking of construction workers' personal vehicles; and possible installation of portable fuel tanks surrounded by earthen berms for spill control. Staging area locations and dimensions have not yet been determined. One or more staging area approximately 10 acres in size will be needed; these temporary facilities will be placed near existing roads and on previously disturbed land (e.g., heavily grazed and/or crop or pasture lands).

4.7 Concrete Supply

The Applicant will contract with one or more local construction companies to install the tower foundations and pads and the transformer pads. These facilities will require sizable volumes of concrete. The construction contractor will be responsible for obtaining the aggregate and concrete necessary to build these features. The contractor could elect to purchase the construction materials from local suppliers, in which case concrete would be manufactured at an existing local plant and trucked to the Project.

Alternatively, the contractor could choose to construct one or more temporary concrete batch plants within or near the Project Area, to minimize the cost impact of transporting concrete to the

Project. In this event, the location and characteristics of the batch plant(s) would be determined by the contractor, and the contractor would be responsible for obtaining any land use or environmental permits required to develop the facilities.

If the batch plant option were selected, the contractor would likely use a portable unit that could be moved to different locations within the Project Area as needed. The batch plant(s) would be set up in a temporary staging area, as described previously, and would use cement, aggregate and water purchased from local sources and delivered to the temporary site by truck. A diesel generator would likely be used to power the plant. Approximately 2 to 3 acres would be required to support a typical temporary batch plant and related facilities. The site would include approximately one acre for the plant itself, 1 acre for raw material stockpiles, and 1 acre for parking, equipment storage and a settling pond.

Portable concrete batch plants, defined as plants that operate at a site for less than one year, are permitted under the State of Washington's Sand and Gravel General NPDES Permit. The general permit specifies discharge limits and requires the operator to develop plans for monitoring, stormwater pollution prevention plan, erosion and sediment control, and spill prevention and control. The permit requires restoration of the site after the portable plant is removed. Best management practices for concrete truck washout require that a settling pond be built to catch the washdown runoff and stormwater runoff. A water storage tank could be used at the plant site to store water hauled from an off-site source if water was not available at the batch plant site.

4.8 Turbine Foundations

Once the Project roads are constructed, excavation will begin for turbine foundations. As described in Section 3.1.2, inverted-T and pile-type foundations are likely to be used, with selection of the foundation design depending on site-specific conditions at each turbine location. In either case, construction of the foundation typically requires 3 days per tower with foundation construction activities expected to occur for approximately 4 to 5 months during the Project's construction process.

The inverted-T foundation requires a circular excavation approximately 8 feet deep and 90 feet in diameter (see **Figure 7A**). Construction for this design involves excavation with a backhoe; placement of a layer of compacted fill at the bottom of the hole; pouring an octagonal-shaped, reinforced-concrete (concrete poured over steel rebar) footing up to 4 feet deep on top of the fill; pouring a 4-foot deep reinforced-concrete pedestal on top of the footing; and covering the footing and pedestal with compacted backfill and topsoil. Steel anchor bolts extending through the pedestal to near the base of the footing will be used in a subsequent step to fix the tower to the foundation.

The pile foundation requires excavating a hole ranging from 25 feet to 35 feet deep (depending on site-specific subsurface conditions) and approximately 18 feet in diameter (see **Figure 7B**). A cylindrical, corrugated metal form approximately 16 feet in diameter will be inserted in the hole, and another cylindrical corrugated form several feet smaller in diameter will be placed inside the larger form. The space between the two forms will be filled with reinforced concrete

and two rings of anchor bolts, and the space inside the inner metal form will be filled with compacted backfill.

If bedrock were encountered at any turbine location, rock anchors would likely be used to secure the base of the foundation. Rock anchors would be used in conjunction with either foundation design. Use of explosives (blasting) might be required for installation of rock anchors.

The Applicant will engage a geotechnical specialist to prepare a geotechnical report for the Project that will be used to determine the appropriate foundation design for each turbine location. The Applicant will also engage a licensed civil engineer during construction to inspect each foundation pour and prepare a quality assurance report for each foundation.

4.9 Collection System

The power collection system for the Project will be installed using underground cable, except where it is not feasible to do so and avoid sensitive environmental features. The cable will be located within the disturbance area for construction of the Project road system to the maximum possible extent. At stream crossings, the cables may be located on the road bridge or structure. Underground cable will be installed using a trenched or plowed-in method. The trenching method requires excavating a trench approximately 3 to 5 feet wide and approximately 2 to 4 feet deep, laying the electrical cables in a part of the trench, partially backfilling the trench, laying parallel communication cables, and backfilling the entire trench. Under the plowed method, the power collection and communication cables will be installed without the need to excavate an open trench; instead, the cables will be directly plowed into the ground. In either case, topsoil will be replaced on the surface of the disturbed area and will be reseeded with native plants. In certain areas, the underground cables may be encased in concrete to provide additional protection and stability in the ground.

4.10 Transmission Connection

Developing the Project transmission interconnection will require constructing an overhead transmission line from the Project substation to the existing transmission line selected as the reception point for power generated by the Project. The transmission interconnection is expected to be a 230-kV line that will be supported on wood-pole structures approximately 76 feet in height. Standard industry construction practices will be used for this facility, including surveying, right-of-way preparation, materials hauling, structure assembly and erection, ground wire and conductor stringing, and cleanup and restoration.

A licensed surveyor will survey the transmission line route and stake structure locations. Holes for the transmission structures will be drilled or augured, typically to a depth of 4 to 6 feet and a width of 2 feet. Construction materials will be hauled by truck to the route and the structures will be assembled on site. Conductor stringing equipment will be placed at either end of the transmission connection; additional areas might be needed for angle locations along the route. Construction activity will be concentrated at staging areas and around structure locations. Cleanup and restoration of disturbed areas will occur following stringing and testing of the line.

Excess topsoil will be tamped around poles or spread on the right-of-way, and disturbed areas will be reseeded with native plants or agricultural crops, depending on the adjacent use.

4.11 Substation and Operation and Maintenance Facility

The Project substation will be constructed while the electrical system components were being installed. Construction activities will include clearing and grading the substation site, which will occupy up to approximately 2 acres; constructing concrete pads for transformers, the control building and other equipment; installing the electrical equipment; assembling the control building; covering the remainder of the site with gravel; and constructing a chain-link fence around the perimeter of the substation site.

The Project operation and maintenance facility will be constructed on a two-acre site. It will involve conventional building construction techniques including site clearing and grading, constructing a concrete pad for the building, framing and finishing the building, installing electrical wiring and plumbing, and constructing a septic system and drain field.

4.12 Turbine Equipment

Once a sufficient number of tower foundations are in place and finished, the first turbine towers, nacelles and blades will be brought to the Project Area for placement. The turbine components will be transported to the Project Area by truck and trailer. The towers will have three sections, each approximately 70 to 90 feet long. They will be delivered by trailers, each carrying one tower section. Large cranes will lift the multiple tower sections into place. The bottom section will be bolted to the circular ring(s) of anchor bolts on the foundation pedestal, and the upper sections will be sequentially bolted in place.

Following foundation construction, the nacelles, rotors and other components will be delivered to the tower locations. The nacelle will be hoisted to the top of the tower by crane and bolted to the tower. The rotor hub and blades will be assembled on the ground, and the assembly will be lifted by crane and secured to the nacelle.

The permanent met towers will also be installed during this stage of the construction process. The tower components will be transported to the construction site in sections, hoisted by crane and anchored to the met tower foundations.

4.13 Final Grading and Restoration

Final grading of disturbed surfaces within the Project Area will occur following completion of the heavy construction activities, and any additional gravel needed will be placed on the Project access roads. All areas temporarily disturbed by Project construction will be restored to their original condition and reseeded with native vegetation. Areas subject to construction activity will be inspected for the presence of noxious weeds and treated as necessary. Long-term stormwater management and erosion control measures. A final site cleanup will be made before

shifting responsibility for the Project Area to the Project operations and maintenance crew, including collection and disposal of all construction debris and other waste materials that could not be reused. County roads will be restored to their pre-Project condition.

4.14 Testing

Following completion of construction activities on the first group of wind turbines, approximately a month of testing will occur before commercial operation begins. Testing will involve inspections of the mechanical, electrical and communication systems to ensure they are working properly and performing according to their respective specifications. The testing process will include checks of each wind turbine and the overall Project control system. Technicians qualified for the specific systems will perform all inspections.

4.15 Transportation and Access Management

Management of construction access and traffic will be a specific focus during the construction process, primarily because of the roadway and traffic considerations associated with transportation of construction materials and turbine components to the Project Area. The Applicant will develop a Construction Traffic Management Plan that will address transportation and access concerns during the construction period. The plan will define access routes and procedures to be used by various types of construction equipment and material shipments, approved hours of operation for construction traffic, safety provisions and other management requirements.

5. OPERATION AND MAINTENANCE

The Applicant intends to operate and maintain the Project once construction is complete and the Project begins commercial operation, though some utilities have shown an interest in purchasing the Project and operating it themselves. Electricity generated by the Project will be sold to power marketing entities, public utilities or investor-owned utilities, and ultimately distributed by utilities to their customers. This section summarizes the activities associated with long-term operation and maintenance of the Project.

5.1 Functions

Long-term operation and maintenance activities for the Project will include the following functions:

- round-the-clock monitoring of Project output, the safety and control system and the performance of individual wind turbines;
- controlling turbine operations as necessary to meet scheduled power deliveries and implement scheduled outages for scheduled turbine maintenance;

- performing periodic, routine testing and maintenance of the turbines as needed to maximize performance and detect potential mechanical difficulties;
- on-site repairs of Project equipment in response to malfunctions or scheduled maintenance;
- patrolling the Project Area to ensure security and monitor on-site conditions, including inspection for erosion, re-vegetation success, unauthorized uses and potential wildlife impacts;
- periodic maintenance of Project access roads, including grading and application of additional gravel, as necessary; and
- implementing the noxious weed control plan.

Through the life of the Project, the Applicant will follow an operations and maintenance protocol that will specify the timing of routine turbine maintenance and inspection. Such a protocol typically adheres to a program developed by the turbine manufacturer, similar to the way automobile manufacturers define recommended maintenance. Scheduled maintenance will be conducted approximately every six months on each wind turbine. On average, each turbine will require 40 to 50 hours of scheduled mechanical and electrical maintenance per year.

Most servicing of the turbines will be performed within the nacelle via access through the tower, rather than using a crane to remove the turbine from the tower. The use of a crane and equipment transport vehicles for turbine adjustments, larger repairs or replacement of rotors or nacelle equipment will be needed on an occasional basis. Routine maintenance will include replacing lubricants and hydraulic fluids at specified intervals. The towers will need to be repainted on a periodic basis. All lubricants, hydraulic fluids, paints, solvents and other potential hazardous substances will be carefully stored, used and disposed of in accordance with applicable laws and regulations.

5.2 Work Force

The Project will employ 10 to 12 full-time staff for long-term operations and maintenance. This staff will include an operations manager, technicians specializing in maintenance and repair of the turbines, and field staff responsible for other Project functions. Most of the O&M staff is likely to be hired from the local work force.

5.3 Access Management

All Project access roads will be posted and maintained as private roads, with locked gates to minimize unauthorized access. Public roads within and adjacent to the Project Area will remain open to public use, as in their current condition.

5.4 Safety Measures

The wind turbines will be monitored continuously by a supervisory control and data acquisition (SCADA) system. Each turbine will be equipped with monitors that communicate operational conditions through communication lines (installed in the same trench as the power collection system). Alarm systems will be triggered if operational characteristics fall outside set limits. Each turbine will have an automatic braking system to shut down the rotor in the event of malfunctions or excessive wind speeds

The turbines will use synthetic oil as a lubricant in the gearboxes and hydraulic fluid for the blade pitch actuators. Each turbine will contain lubricating oil. Turbine oil will be tested regularly and replaced as needed. Waste oil and fluid collected during maintenance will be transferred to an approved waste facility.

enXco has developed and implemented standard safety plans at the wind energy facilities that it operates. The safety plans include key components that are specific to wind energy facilities, such as fire safety and emergency tower rescue programs. These programs define hazards that could be present, prescribe procedures to be followed by operations and maintenance personnel, identify equipment needed to implement the programs, and specify applicable training requirements. These safety plans will be employed for the Project, with Project-specific modifications as necessary.

5.5 Expected Operating Patterns

The Project's wind turbines will not operate during all hours of the year because the wind does not blow at sufficient speeds to operate the turbines all of the time. The Applicant has collected over 7 years of meteorological data within the Project Area. These data were correlated with existing public data collected at Bowers Field. Based on the combined wind data, the Applicant expects the Project to operate approximately 60 percent of the time (approximately 5,300 hours annually), and be idle during the remaining time (approximately 3,500 hours annually). Annual and seasonal variations are expected.

Based on recent historical wind data, the majority of the annual production from the Project will occur from March through October. There are approximately 5,880 hours during this 8-month period. The turbines will likely be in production (i.e., the blades will be turning and producing some electricity) approximately 71 percent of the time during the spring-summer period, or approximately 4,170 hours. The turbines will be idle the remaining 29 percent of the time, or approximately 1,700 hours. Out of the approximately 2,880 hours in the fall and winter months from November through February, the turbines will be in production approximately 36 percent of the time (i.e., approximately 1,040 hours) and sitting idle the remaining 64 percent of the time (i.e., approximately 1,840 hours). During both periods of the year, the majority of the daily production and operation time will occur during daylight hours. Over the course of the year, two-thirds (67 percent) of the production and operation will likely occur from 7 a.m. to 10 p.m.

6. MITIGATION MEASURES

The Applicant will incorporate mitigation measures into the Project consistent with and based upon the analysis contained in the Revised Application, the SEIS or the County FEIS. This section summarizes the mitigation measures outlined in Chapter 3 of the County FEIS, along with updated measures proposed by the Applicant.

6.1 Erosion (County FEIS § 3.1)

The Applicant will develop and implement a Construction Stormwater Pollution Prevention Plan (SWPPP) that satisfies the requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activities. The SWPPP will include Best Management Practices (BMPs) recommended by Ecology's *Stormwater Management Manual for Eastern Washington.* The Construction SWPPP will include measures for temporary erosion and sedimentation control, and will identify a regular inspection and maintenance schedule for all erosion control structures.

6.2 Landslides (County FEIS § 3.1)

To mitigate potential landslide hazards as a result of construction, the Applicant will use setback distances for structures, infiltration systems, and detention ponds, where appropriate and feasible. The setback distances are based on the analysis in the County FEIS, and are more stringent than those recommended in the *Uniform Building Code.* Setback distances could be reduced and/or eliminated depending upon the detailed design plans and additional, site-specific studies of the geological conditions.

The Applicant will generally maintain a minimum setback distance of 125 feet between Project facilities and areas classified as Landslide Hazard Zone 1, and a setback distance of 50 feet between Project facilities and areas classified as Landslide Hazard Zone 2.

In addition to these setbacks, the Applicant will implement the following mitigation measures:

- If construction occurs within areas of the Project Area classified as Landslide Hazard Zones 1 and 2, then stormwater from those construction sites will be collected and tightlined away from the top of such areas.

- No fill, topsoil, or other debris will be placed over the top of areas within Landslide Hazard Zone 1. Any fill planned for slopes steeper than 5H:1V (Horizontal : Vertical) will be benched and compacted into the hillside pursuant to a geotechnical engineer's recommendations.

- The Applicant will not remove any vegetation from areas within Landslide Hazard Zone 1, with the exception of dead or diseased trees, unless approved by a

geotechnical engineer. Vegetation removed from Landslide Hazard Zone 2 areas will be limited to the immediate vicinity of construction.

- The Applicant will retain a geotechnical engineer licensed in Washington State to review and approve all grading, erosion, and drainage control plans prior to construction to assist in reducing the landslide risks from and to the Project.

6.3 Seismic Activity (County FEIS § 3.1)

The Applicant will comply with the building code in effect in Kittitas County when construction commences.

6.4 Air Quality (County FEIS § 3.2)

The Applicant will implement the following standard practices to reduce the air emissions from construction activity:

- To reduce emissions from construction equipment and vehicles, the construction contractor will be required to use well-maintained equipment and avoid prolonged periods of vehicle and equipment idling.

- Dust produced by construction will be reduced by spraying water or other dust suppressants over areas of exposed soils such as storage yards and construction roadways. Roads and other areas that might be exposed for prolonged periods will be paved, planted with a vegetation ground cover, or covered with gravel. Subject to receiving approval from appropriate agencies, the Applicant may use dust palliatives, such as calcium chloride, on road surfaces to reduce the amount of dust created by vehicle traffic on unpaved roads. A 25 mph speed limit will be maintained on unpaved roads within the Project Area.

- Truck beds will be covered when transporting dirt/soil outside of the Project Area.

- All stored construction materials that may cause air emissions will be covered.

6.5 Surface Water (County FEIS § 3.3; Wetlands and Stream Report – Tab 4)

The revised Project configuration avoids any temporary or permanent impact to streams, wetlands, or their buffers.

Project construction staging areas will not be located within 100 feet of drainages or any other body of water to reduce the potential contamination from spills. The Applicant will use BMPs to control the use and disposal of waste materials during and following Project construction, including implementation of a spill prevention, containment and control plan.

The Applicant will store hazardous materials, such as lubricants, in approved containers and storage facilities. The Applicant will provide on-call spill response services either through a contract with a qualified environmental remediation services firm or with qualified in-house personnel.

6.6 Vegetation (County FEIS § 3.4; Vegetation and Wildlife Report – Tab 5)

During project construction, the Applicant will employ BMPs to reduce peripheral impacts to adjacent native vegetation and habitats and to minimize the construction footprint. The Applicant will micro-site Project facilities to minimize impacts from roads and utility crossings to riparian habitat to the greatest extent possible.

The Applicant will incorporate the following mitigation measures to facilitate restoration of temporarily disturbed areas in the Project Area and to avoid, minimize or reduce impacts of noxious weeds:

- Standards for site restoration will be established as part of the Final Construction Plans. The post-construction restoration or reclamation plan for the temporarily disturbed areas will include provisions for continuing active restoration until site stability or the reference standards are achieved.
- Site reclamation and reseeding will occur during the time of year when seed germination and establishment is most likely to be successful.
- The construction contractor will be required to clean construction vehicles prior to bringing them in to the Project Area from outside areas.
- Disturbed areas will be re-vegetated as quickly as possible with native species.
- If the construction contractor uses hay for sediment control or other purposes, it will certify that the hay bales are weed free.
- Noxious weeds that have established themselves as a result of the Project will be actively controlled in consultation with the Kittitas County Weed Control Board.

6.7 Wetlands (County FEIS § 3.4; Stream and Wetland Report – Tab 4)

The Project has been designed to avoid temporary or permanent impacts to wetlands, including specified buffers, in the Project Area. Any work adjacent to wetlands will adhere to the applicable laws, including federal and state regulations. If wetlands are inadvertently disturbed during construction, the Applicant will restore the wetlands and re-vegetate them if appropriate.

6.8 Wildlife (County FEIS § 3.4; Vegetation & Wildlife Report – Tab 5)

The Applicant will establish a Technical Advisory Committee (TAC) pursuant to the *WDFW Wind Power Guidelines*. The TAC will ensure that monitoring data is considered in a forum in which independent and informed parties can collaborate with the Applicant. The TAC will make recommendations to EFSEC if it concludes that additional studies or mitigation are warranted to address impacts that were either not foreseen in the Application, County FEIS or EFSEC SEIS, or exceed impacts that were projected.

The TAC will have up to nine (9) members. Pursuant to the *Guidelines*, the TAC will be composed of one representative each from U.S. Fish and Wildlife Service, the Washington Department of Fish and Wildlife, the Washington Department of Natural Resources, Kittitas County, and the Project owner/developer, at least one representative from amongst the five private participating landowners, and up to three more members, including local landowners or other concerned interests (e.g., Kittitas Audubon Society). The Applicant will provide meeting space and logistical support for the TAC, but TAC members will not be reimbursed for any time or expenses related to their participation on the TAC.

Pursuant to the Guidelines, the TAC may recommend additional or alternative mitigation measures from those contained in this Application. Any recommendation by the TAC must be approved by a majority of the TAC which majority must include the representatives from WDFW, USFW and WDNR. The Applicant may accept the TAC's recommendation voluntarily. In the event that the Applicant does not accept a TAC recommendation, the TAC may forward the recommendation to EFSEC. EFSEC will then determine whether: (i) the TAC's recommendation is reasonably necessary to mitigate identified adverse impacts of the Project; and (ii) the TAC's recommendation is reasonable and capable of being implemented. If the EFSEC makes such findings, EFSEC will require the Applicant to implement the recommendation.

The Applicant will develop a Post-construction Avian Monitoring Plan in coordination with the TAC. At a minimum, the monitoring plan will include: (i) a 1-year standardized fatality monitoring program involving carcass searches, scavenger removal trials, a searcher efficiency trial; and (ii) a standard procedure for O&M personnel to report incidental bird fatalities and/or bird injuries over the life of the Project. The protocol for the fatality monitoring study will be similar to protocols used at other, newer-generation wind plants in northeastern Oregon and southeastern Washington.

The primary impacts associated with the Project are expected to be loss of shrub steppe habitat, fatalities of birds, and potential displacement effects on mule deer. The Applicant will provide the following mitigation measures to address these impacts:

- The Applicant will identify environmental features such as riparian corridors and raptor nest sites that are not to be disturbed. Those areas will be mapped, flagged, and/or identified to all contractors working on-site as "no disturbance" zones during the construction phase.

- The Applicant will develop a site management plan to, at a minimum, identify Environmental Features and wildlife areas (e.g., raptor nests), provide adequate on-site waste disposal, and establish fire management and erosion control procedures.

- Raptor nests within ½ mile of construction areas will be monitored for activity prior to construction to determine the need for construction timing restrictions around active nests.

- All power and communication lines on-site will be buried underground where feasible.

- All overhead power line poles will be equipped with anti perching devices.

- Permanent met towers on-site will be free-standing to eliminate the potential for avian collisions with guy wires.

6.9 Livestock and Hunting

Livestock grazing will not be allowed in those Project areas in which active construction is occurring. Hunting will not be allowed in the Project Area during construction.

6.10 Habitat Mitigation Parcel

The Applicant will provide a Mitigation Parcel or pay a Mitigation Fee consistent with the *WDFW Wind Power Guidelines.*

6.11 Energy and Natural Resources (County FEIS § 3.5)

No significant impacts to energy and natural resources would occur, and therefore, no mitigation measures are proposed.

6.12 Cultural Resources (SEIS § 3.3)

The Applicant will address cultural resources in the final design and micro-siting process. Impacts to cultural resources can be avoided or mitigated in several ways.

It may be possible to avoid all or most impacts to significant cultural resources sites by micro-siting wind turbines and other associated facilities in order to maintain a 100-foot (30-meter) buffer area around the recorded boundary of each significant archeological or historical site. In some cases, a turbine may be moved a short distance, allowing straight-line road or transmission line connections between turbines to be moved away form the resources. In other cases, if the turbine is not within the archeological or historic site, the road or electrical connections could be re-routed to avoid the site.

In order to avoid sites in this manner, the boundaries of identified cultural resources (with suitable buffer zones) will be staked in the field and flagged as no-disturbance areas to avoid inadvertent entry or disturbance during construction. To preserve confidentiality of the resource locations, site markings would be removed following construction.

Given other siting constraints, it may not be possible to avoid all significant cultural resources. When sites or their buffers cannot be avoided, mitigation measures will be implemented to retrieve the scientific and historical information that makes the resources significant. Other ways of mitigating adverse effects include maintaining or restoring the integrity of the site to the extent possible, relocating historic structures, and tribal consultation. For significant archeological sites that cannot be avoided, Desert Claim will develop a cultural resources mitigation plan in consultant with the Department of Archeological and Historic Preservation (DAHP) and affected Native American tribes.

Other isolated finds and non-significant archeological sites may be impacted during construction of the Project. It may not be necessary to avoid these sites and isolates given their low or non-existent data potential. However, mitigation measures would be implemented, such as documenting existing conditions and moving the resources out of the direct impact area.

In response to comments from DAHP, the Applicant has also agreed to document the current cultural landscape and develop a landscape history prior to construction.

The Applicant will also develop an unanticipated discovery plan that will provide a protocol for the evaluation and treatment of any archaeological remains or human remains that might be discovered during construction.

6.13 Land and Shoreline Use (County FEIS § 3.7)

No significant impacts would occur, and therefore, no mitigation measures were identified.

6.14 Mechanical Hazards (County FEIS § 3.8; Hazard Report – Tab 7)

The Applicant intends to use the REpower MM92 turbine for the Project. This turbine is equipped with multiple safety systems as standard equipment, including rotor speed controlled by a redundant pitch control system, an automatic backup disk brake system, multiple temperature sensors and a control system that will shut a turbine down and take it off-line if an overheat or overspeed condition is detected. The turbines also will be equipped with a lightning protection system.

The Applicant will use turbines designed to the requirements of the International Electrotechnical Committee (IEC) 61400-1 Standard, which is sufficient to assure that the static, dynamic and defined-life fatigue stresses in the turbine blade will not be exceeded under the combined load cases expected at the Project Area.

Public access will be restricted and no high-value public facilities will be located within the safety zone established.

6.15 Tower Collapse, Blade Throw and Ice Throw (Hazard Report – Tab 7)

The Project configuration includes a 625-foot safety zone setback from the Project boundary[2] and all public roads and existing utility transmission corridors. The setback was calculated for the specific turbine model selected for the Project. The 625-foot safety zone is sufficient to provide adequate and reasonable protection for tower collapse, blade throw and ice throw hazards associated with the Project (KFPP Consulting 2006).

6.16 Fire Hazards

The Applicant will provide the following measures intended to prevent fires and minimize the consequences of any fires that might occur:

- During the construction period, all workers will be given fire safety training.
- The Applicant, through its construction contractor, will implement a work plan that minimizes the risk of fire.
- Appropriate fire suppression equipment will be available to designated employees trained in its use.
- The construction contractor will use mufflers and spark arrestors on all construction equipment.
- The Final Construction Plans will provide for required construction shutdowns, and limitations on "hot" work when necessary, as directed above.
- During operation, the Applicant will provide regular turbine maintenance, including review of real-time and stored temperature sensor readings that will be used to highlight developing problems and facilitate prevention of equipment-caused fire.
- The Applicant will use turbines that have a temperature recording and control system that include real-time monitoring, operator alarms and automatic turbine shut-down mechanisms in each nacelle in order to supplement the Project's standard fire prevention measures.
- The Applicant will maintain updated emergency contact information and coordination procedures within the O&M Facility.

[2] As stated above, there is one exception to this general rule. In the southwest portion of the Project Area, turbines may be located closer than 625 feet from the Project Area boundary, but the adjacent participating property owner has agreed to maintain the safety setback from all buildings.

6.17 Electrical Hazards (County FEIS § 3.8)

The Applicant will use the following mitigating measures to minimize potential health and safety risks associated with electrical hazards from the Project:

- Prior to starting construction, the construction contractor will prepare and maintain a safety plan in compliance with Washington requirements. This plan will be kept on-site and will detail how to manage hazardous materials such as fuel, and how to respond to emergency situations.

- During construction, the contractors will hold regular crew safety meetings to go over potential safety issues and concerns related to working on electrical facilities.

- At the end of each workday, the contractor and subcontractors will secure the site to protect equipment and the general public.

- Selected employees will be trained, as necessary, in tower climbing, cardiopulmonary resuscitation, first aid, rescue techniques, and safety equipment inspection.

- If implosion bolts are used to connect the conductors, they will be installed in such a way as to minimize potential health and safety risks to workers.

- Project workers will stay on established Project access roads during routine operation and maintenance activities.

- Vegetation will be trimmed to avoid contact with collection and interconnection lines.

- All new Project power collection system cables and interconnection transmission lines will be constructed and operated to meet the National Electrical Safety Code.

- Installation crews will clearly mark the location of all buried Project Power Collection System cables.

The Applicant will provide the following mitigating measures to address potential telecommunications interference associated with electromagnetic or physical conditions that might result from the Project:

- The Applicant will conduct a study of potential microwave interference prior to final location of turbines, and move or eliminate turbines that will block microwave pathways.

- The Applicant will conduct baseline monitoring of television reception quality within a one-half mile of the Project Area. Means to accomplish this can range

from contracted studies by qualified professionals to sample before-and-after videotaping.

6.18 Shadow Flicker (Shadow Flicker Report – Tab 7)

The Applicant has revised the Project configuration to substantially reduce the potential for adjacent residences to experience shadow flicker, if not eliminate it altogether. (GEC 2008b). Shadow flicker is not expected to be noticeable beyond 1,500 feet from a turbine. If non-participating residences experience shadow flicker, the Applicant will stop the blades of the wind turbine that causes the flicker during those hours and conditions when shadow flicker occurs, or offer a voluntary waiver agreement to the landowner in lieu of stopping the turbine.

6.19 Noise (County FEIS § 3.9; Sound Report- Tab 5)

The Applicant has revised the Project layout so that sound levels during Project operation will be 50 dBA or less at the boundary with non-participating residential properties. (GEC 2008a). Sound levels may exceed 50 dBA on an adjoining property to the west and south of the Project Area, but the property is owned by a participating property owner who has agreed to waive the 50 dBA limit.

In order to minimize noise during construction, the Applicant's construction contractor will be required to employ standard management practices, including the following measures:

- require use of properly sized and maintained mufflers, use of engine intake silencers and engine enclosures when the engine is the dominant source of noise, and that idle equipment be turned off when not in use for extended periods of time;
- stationary equipment will be placed as far away from residential receiving locations as possible whenever construction occurs within 100 feet of the project boundary. Where this is infeasible, portable noise barriers will be placed around the equipment with the opening directed away from a receiving property;
- require use of hydraulic or electric models for impact tools -- such as jackhammers, rock drills and pavement breakers – to reduce construction and demolition noise; and
- require operators to lift rather than drag materials wherever feasible.

6.20 Aesthetics, Light and Glare (SEIS § 3.4))

In order to minimize aesthetic, light and glare impacts during Project construction, the Applicant will:

- Periodically remove construction debris.

- Replace native vegetation disturbed in non-road surface areas or non-turbine areas as soon as possible.

- Seed or cover temporarily stockpiled materials and disturbed sites that will sit dormant for more than 3 months to keep down dust and prevent soil erosion.

In order to minimize the aesthetic, light and glare impacts of the Project, the Applicant will:

- Maintain high-quality turbine towers, nacelles, and blades, and remove or promptly repair all parts of non-functioning turbines.

To the extent feasible, the Applicant will:

- Construct Project buildings of local materials and in local building styles to maximize their fit in the vernacular landscape.

- Use native shrub-steppe vegetation around buildings and equipment boxes to integrate the structures into surrounding landscape.

- Use existing roads to access turbines.

- Not piggyback advertising, cell antennas, or other clutter on the turbines and not display the logo of the manufacturer prominently on the turbine nacelle.

- Use low-reflectivity, neutral-color finishes for turbines, and other Project facilities. Earth-tone finish will be used on the O&M Facility to better blend it with the surrounding landscape.

- Minimize security lighting at the Project substation, and make any ground level security lighting motion-sensitive so that most of the time it does not impact the night landscape. Use lighting devices designed to be least visible from ground level.

6.21 Recreation (County FEIS § 3.11)

No significant impacts to recreation were identified, and therefore, no mitigation measures are proposed.

6.22 Ground Transportation (County FEIS § 3.12)

The Applicant will mitigate traffic impacts associated with construction of the Project by developing and implementing a Construction Traffic Management Plan.

6.23 Air Transportation (County FEIS § 3.13; FAA Lighting Report – Tab 9)

The Applicant will provide to EFSEC copies of the Determination of Non-Hazard certificates issued by the Federal Aviation Administration (FAA) and related information, which demonstrates that the Project will not impact approved flight approaches, flight communications or operations at the Kittitas County Airport (Bowers Field) prior to the start of construction.

The Applicant will equip approximately forty-one turbines with FAA required synchronized flashing red lights for evening/nighttime hours.

6.24 Public Services

Fire Protection and Emergency Medical Services

The Applicant entered into a Fire Services Agreement with Kittitas County Fire Protection District No. 2 on February 10, 2005. Kittitas Valley Fire & Rescue has replaced the former District No. 2. The Applicant will work with the Kittitas Valley Fire & Rescue District to identify water supplies within the Project Area required for firefighting.

The Applicant will meet implement the following measures to reduce fire risk:

- During construction, power equipment will be equipped with safety features, including spark arrestors and/or approved mufflers, fire extinguishers and shovels.
- Equipment shutdowns will be required during periods of general industrial fire precautions in the local area, and limitations regarding "hot" work with electrical equipment and facilities will be observed.
- In order to prevent fires caused by catalytic converters on vehicles, designated parking areas will be created for workers' vehicles.
- Designated worker smoking areas will be established to reduce the potential for fire.
- The Applicant will develop and implement a worker-oriented fire prevention program to provide additional knowledge of wildfire prevention and control practices to workers.
- The Applicant will provide a "knox box," a fire service access box containing master keys, in all secured areas (i.e., buildings or gates) to facilitate access to the site by fire and emergency medical crews.
- The Applicant will provide fire, emergency medical, police agencies, and KITTCOM with emergency contact and response information relating to the

design of the Project, including the detailed maps of Project access roads, on-site facilities, and Turbines, and an addressing plan.

- The Applicant will institute procedures for rescue operations should an incident occur inside a turbine nacelle (including available on-site emergency rescue equipment).

- The Applicant also will execute an agreement with the appropriate agency addressing training and equipment related to potential high-angle rescue needs at the Project. Alternatively, the Applicant may provide this training and equipment internally through Project resources, in which case, the Applicant will submit a copy of its training regime and equipment list to the EFSEC prior to the start of Project construction.

- During both construction and operation of the Project, the Applicant will locate refuse containers in areas that will reduce the potential for uncontained on-site debris.

- With the exception of natural vegetation, no burning of debris will be allowed without written permits from issuing agencies (DNR and DOE).

- All flammable liquids will be stored according to 1997 Uniform Fire Code and inspected by the responsible agency.

Law Enforcement

The Applicant will provide on-site security (including private security patrols as necessary) in order to reduce the potential for Project-related calls to local law enforcement.

6.25 Population, Housing and Employment (County FEIS § 3.15)

No significant adverse impacts to population, housing and employment were identified, and therefore, no mitigation measures are necessary.

6.26 Fiscal Conditions (County FEIS § 3.16)

The Project will have a significant positive impact on fiscal conditions in Kittitas County. No mitigation measures are proposed.

7. DECOMMISSIONING & SITE RESTORATION

The Applicant proposes to operate the wind energy facility throughout the useful life of the Project, which is assumed to be 30 years. New technology may become available for re-powering the Project (replacing the generators and/or other major turbine components) at some time in the future.

At the time the Applicant decides to terminate operation of the Project, the Project will be decommissioned. Decommissioning the Project will involve removal of the wind turbine nacelles, blades, towers, foundations, cables, and other facilities to a depth of 4 feet below grade; regrading the areas around the Project facilities; removal of Project access roads (except for any roads that landowners wanted to remain); and final restoration of disturbed lands.

If any turbine generates electricity for fewer than 250 hours during a continuous period of twelve months, it will be decommissioned. However, if a turbine stops generating electricity due to force majeure, mechanical breakdown or malfunction, the Applicant may repair rather than decommission the turbine.

Prior to commencing construction, the Applicant will post a bond or corporate surety in favor of EFSEC, to cover decommissioning costs. The initial amount of the bond or corporate surety will be comparable, on a per turbine basis, to the security required by EFSEC for similar wind projects under its jurisdiction. The bond or corporate surety will name the Project landowners as additional beneficiaries.

8. REFERENCES

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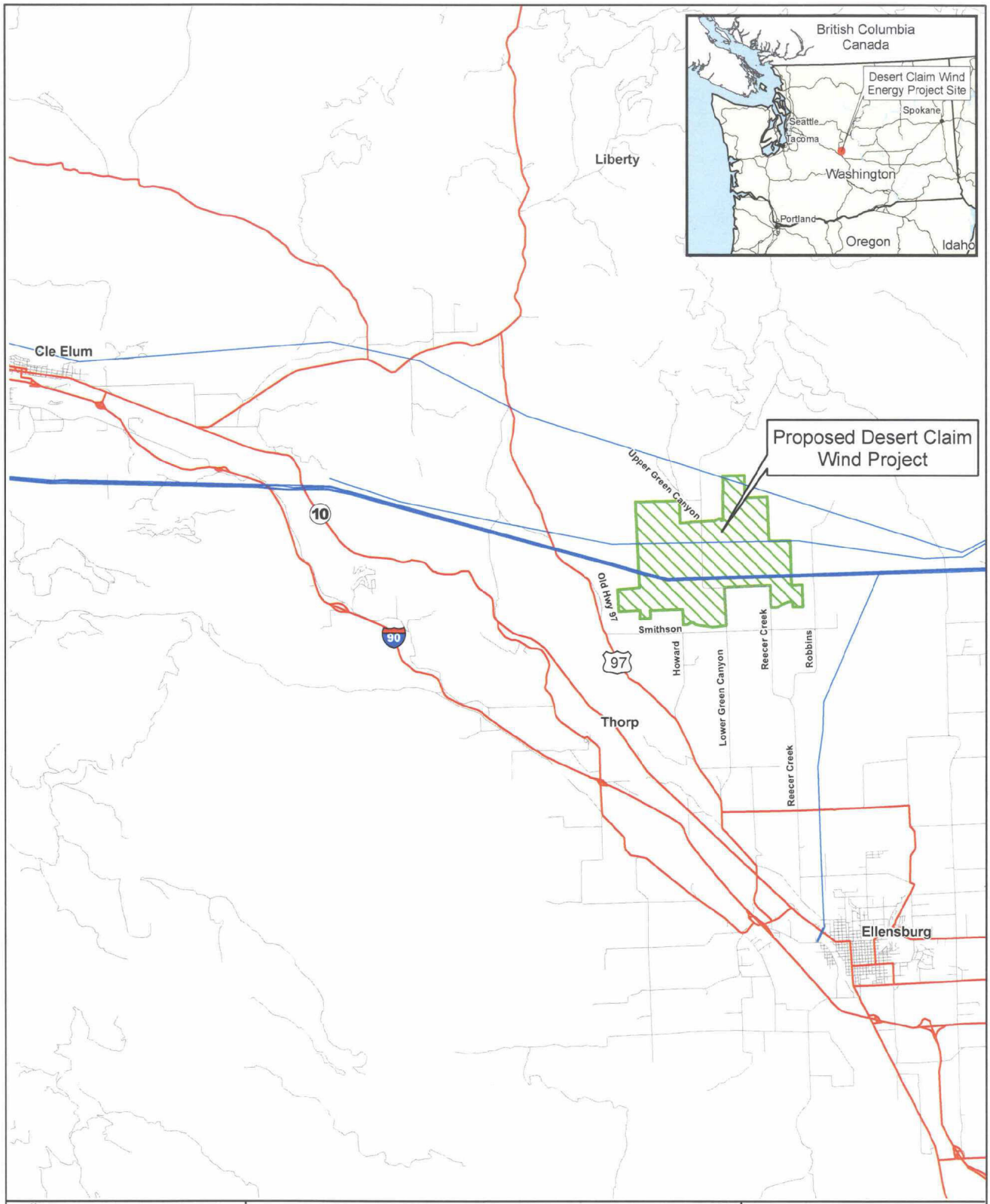


Desert Claim Wind Power
a renewable energy project by enXco

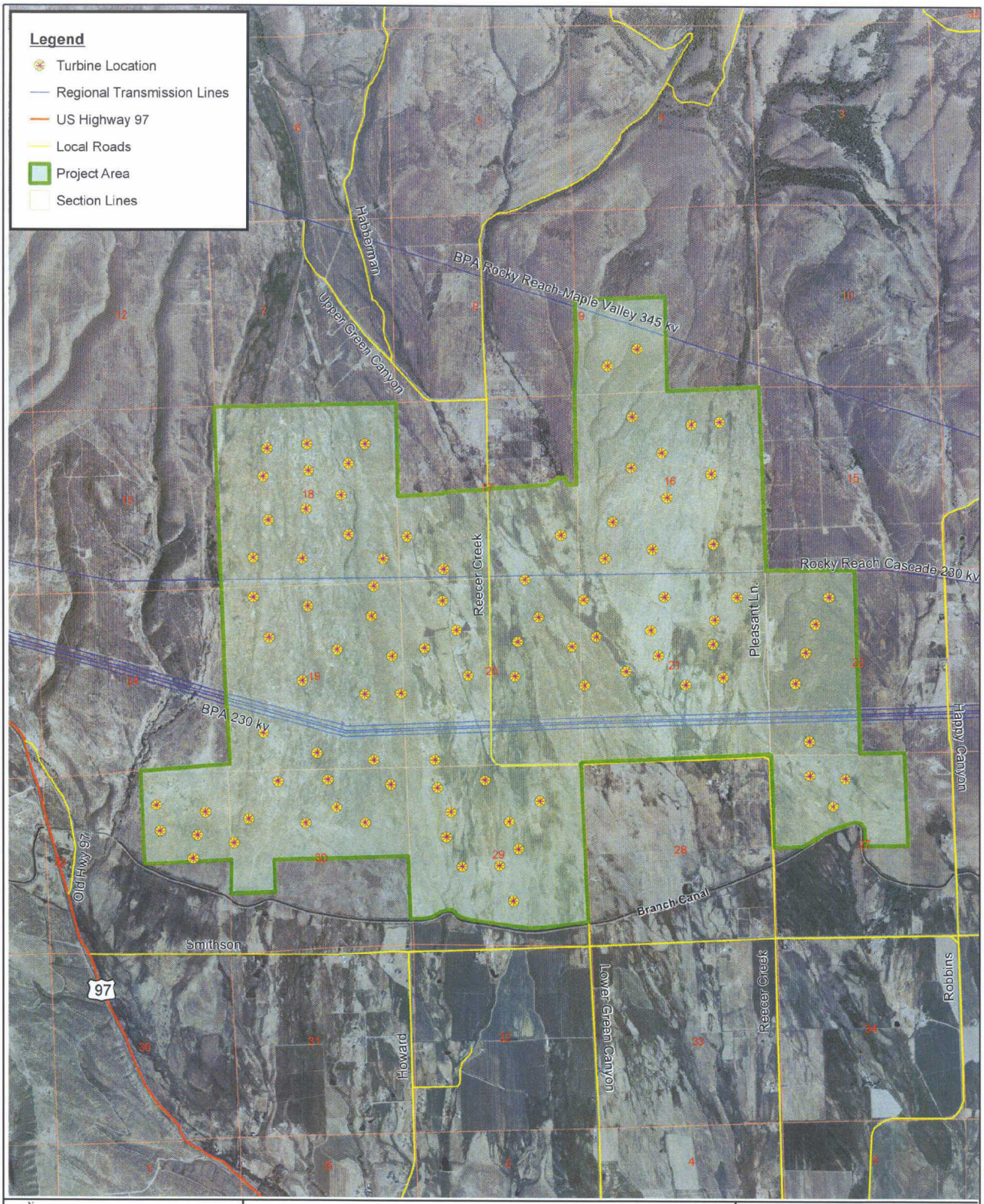
DESERT CLAIM WIND POWER

Kittitas County, Washington

Figure 1
Project Area
Vicintiy Map

Date: 11/7/2008	GIS Analyst: avh
Map Source Information:	

...\desert_claim\turbine_layout_7-24-08\figures\figure 1 project area and vicinity map.mxd



DESERT CLAIM WIND POWER

Kittitas County, Washington

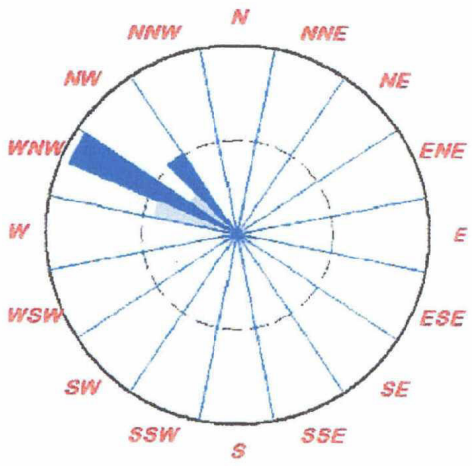
Figure 2
Project Area

Date:	GIS Analyst:
11/7/2008	avh

Map Source Information:
NAIP 2006 Kittitas County

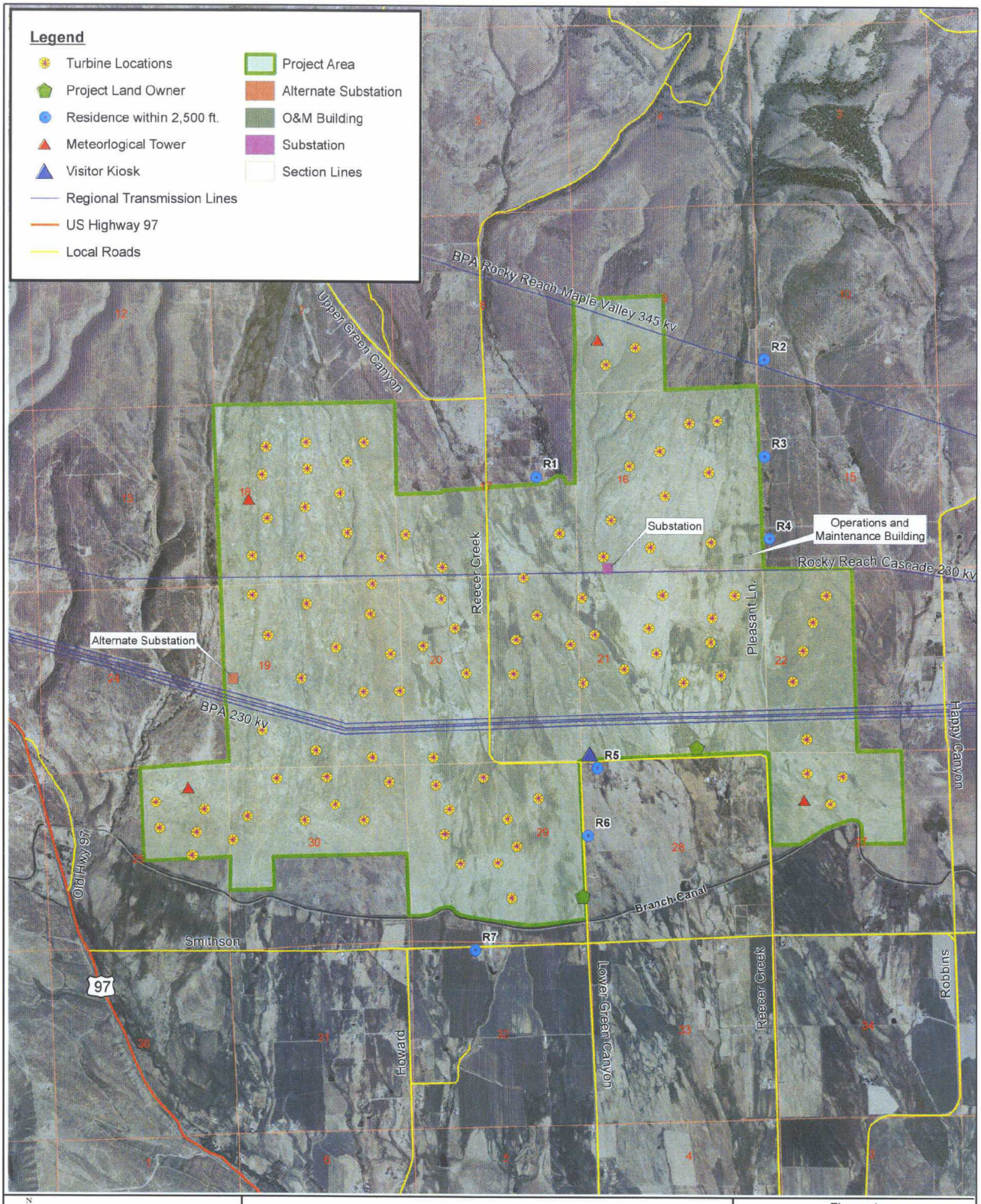
...\desert_claim\turbine_layout_7-24-08\figures\figure 2 project area with setback_topo.mxd

enXco - Desert Claim Project
Mast 209
50 m Wind Rose Graph
July 2001 - June 2005



Percent of Total Wind Energy (Wh/m^2):
Percent of Total Time:
Circle Center: 0.0%
Inner Circle: 32.5%
Outer Circle: 65.0%

Desert Claim Wind Power Kittitas County, Washington	**DESERT CLAIM WIND POWER** Kittitas County, Washington	Figure 3 **WIND ROSE FOR PROJECT AREA** Date: 10/2/2006 | GIS Analyst: avh Map Source Information: USGS Topographic Map, 1:24,000 scale.



0 0.125 0.25 0.5 0.75 1 Miles
Scale 1:48,000

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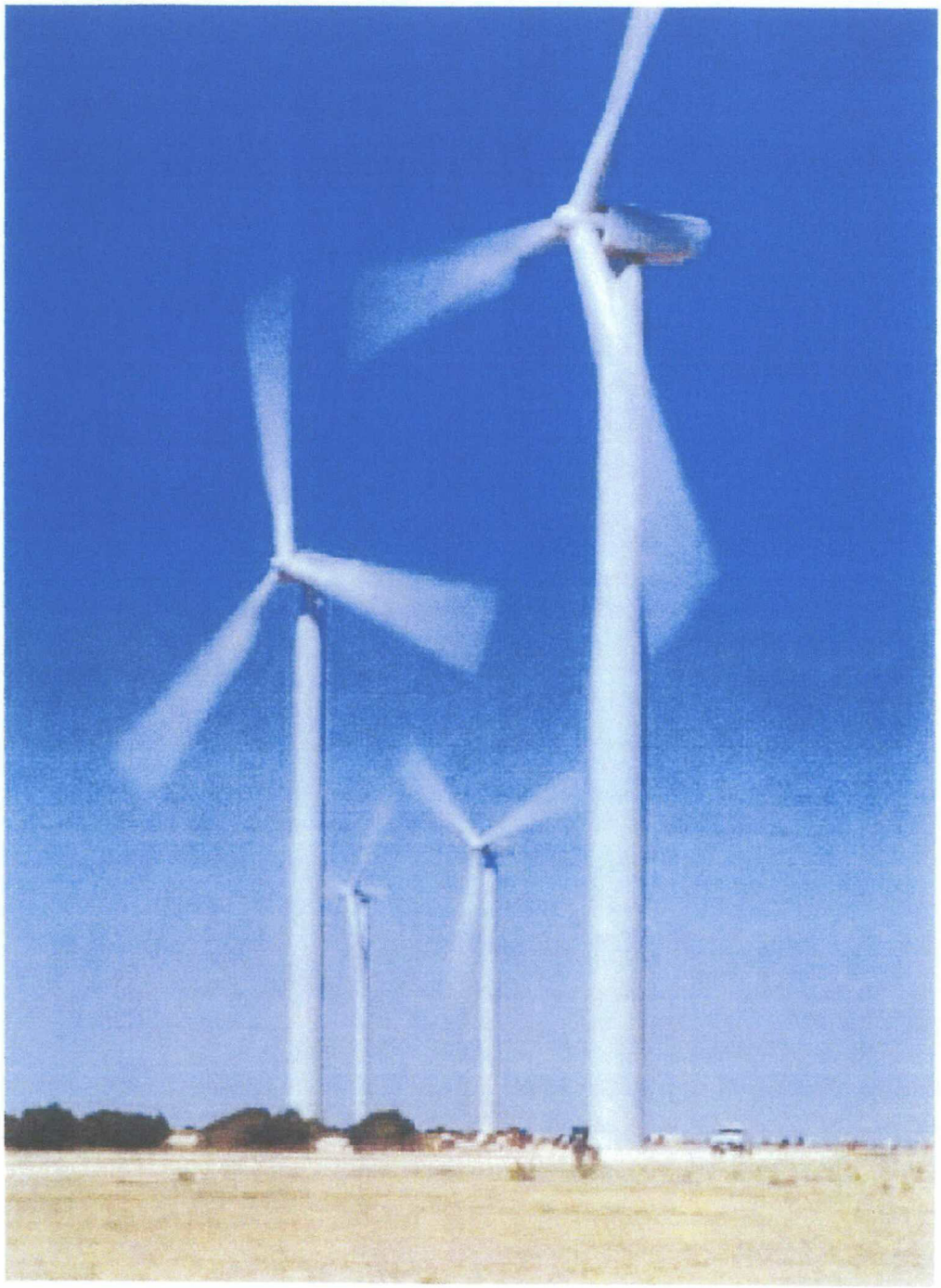
DESERT CLAIM WIND POWER

Kittitas County, Washington

Figure 4
Project Area with Neighboring Residences (less than 2,500 ft. from a turbine)

Date: 11/7/2008	GIS Analyst: avh
Map Source Information: NAIP 2006 Kittitas County	

...\desert_claim\turbine_layout_7-24-08\figures\figure 4 project area with residences.mxd



Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WIND POWER

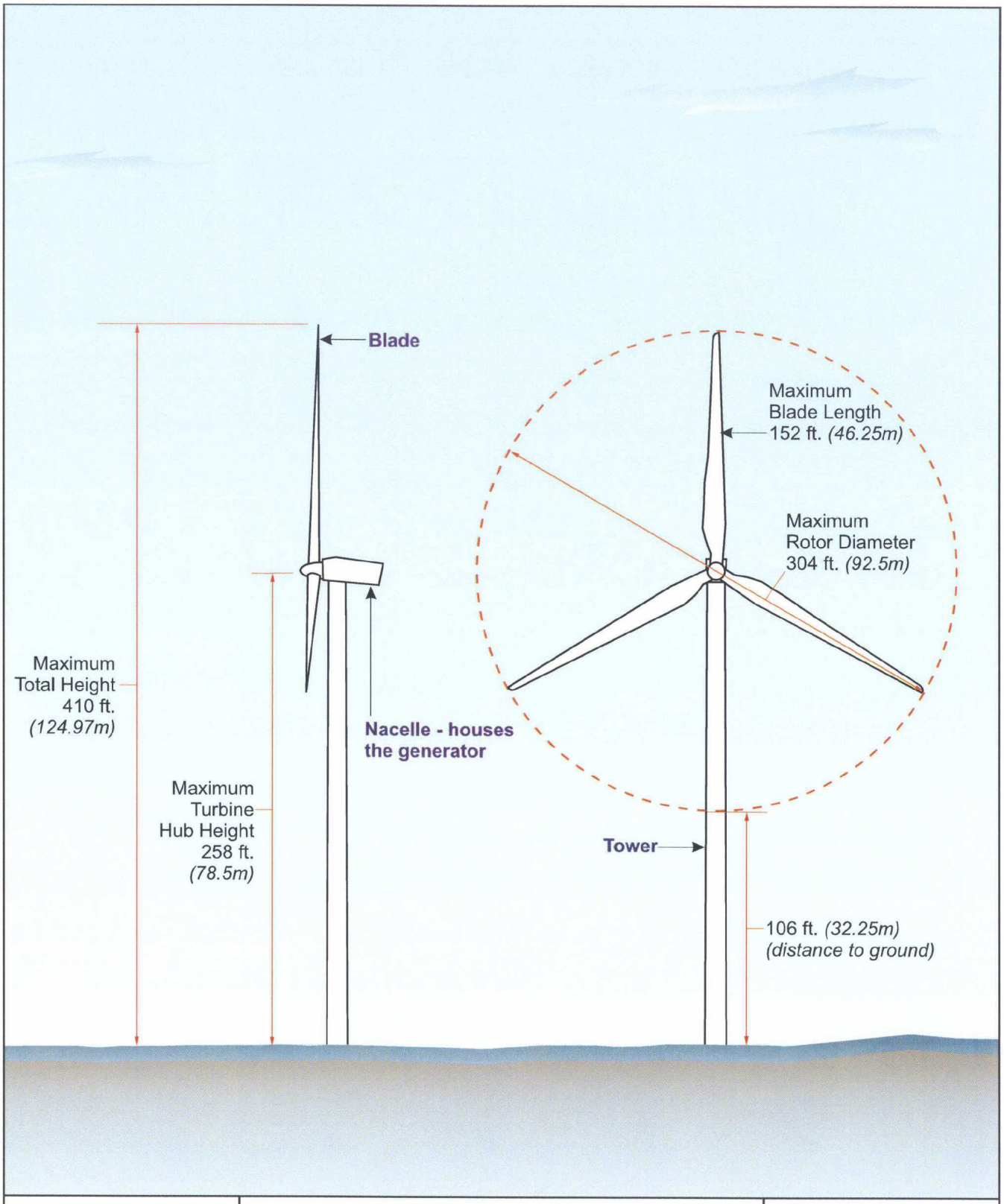
Kittitas County, Washington

Figure 5

TYPICAL WIND TURBINES IN OPERATION

Date: 10/2/2006	GIS Analyst: avh

Map Source Information: USGS Topographic Map, 1:24,000 scale.



Not to Scale

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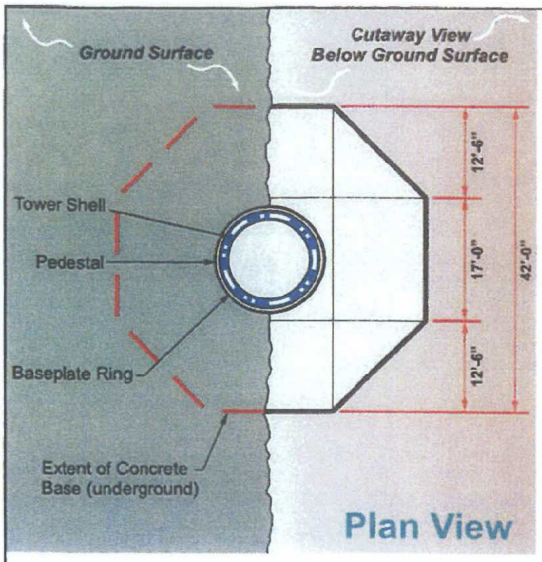
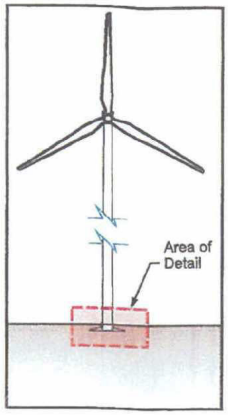
DESERT CLAIM WIND POWER

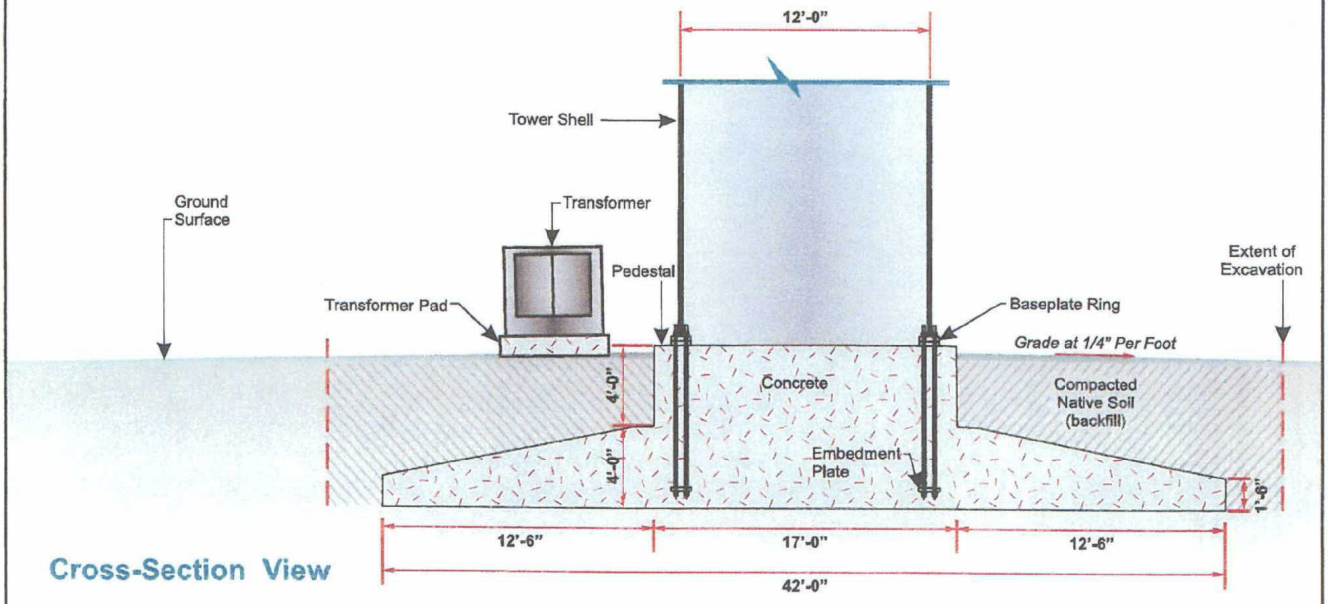
Kittitas County, Washington

Figure 6
DIAGRAM OF PROPOSED WIND TURBINE

Date: 1/8/2009	GIS Analyst:
Map Source Information:	

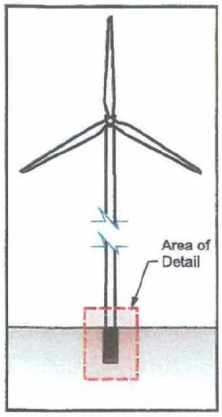


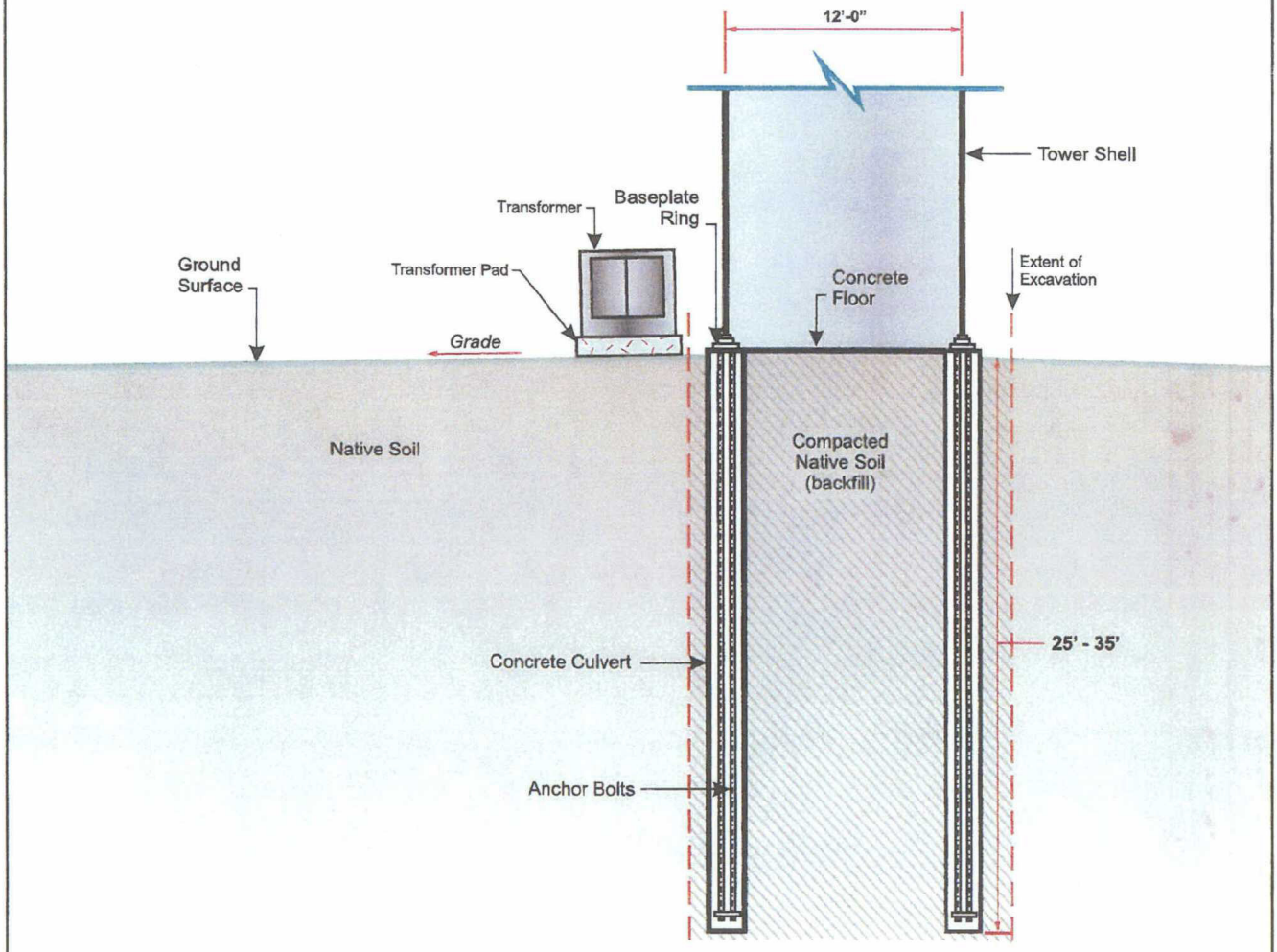




INVERTED T TYPE FOUNDATION

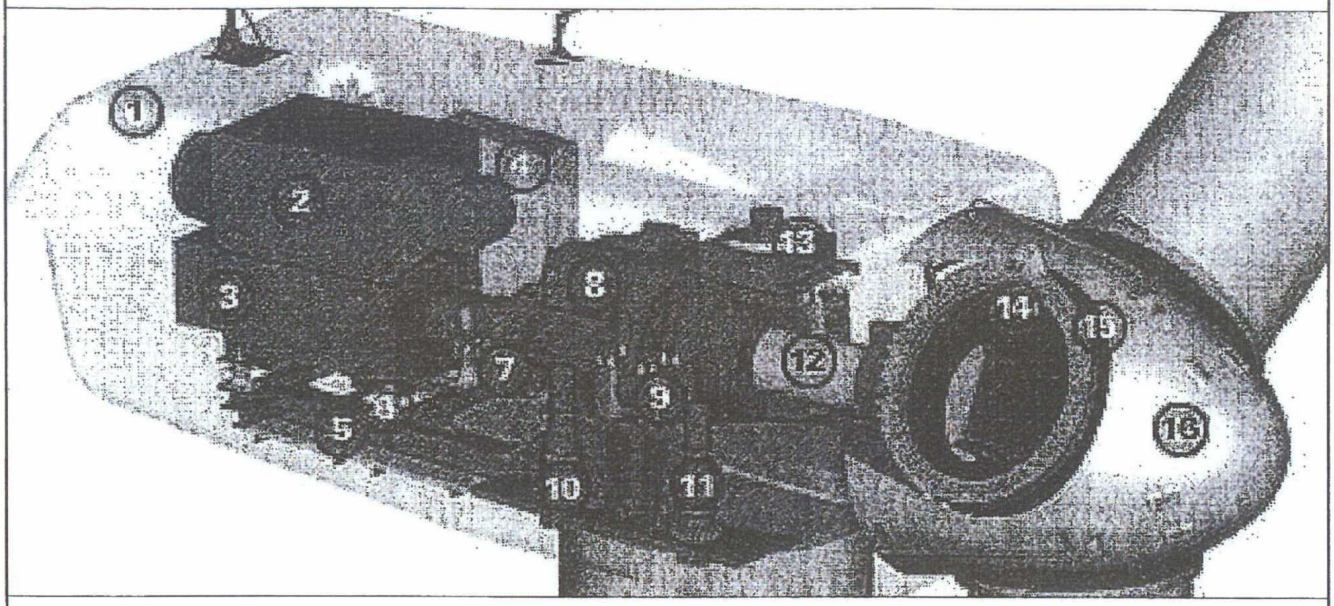
Not to Scale	**DESERT CLAIM WIND POWER**	Figure 7A **TYPICAL TURBINE FOUNDATION - INVERTED T**
Desert Claim Wind Power Kittitas County, Washington	Kittitas County, Washington	Date: 10/19/2006 | GIS Analyst: Map Source Information:





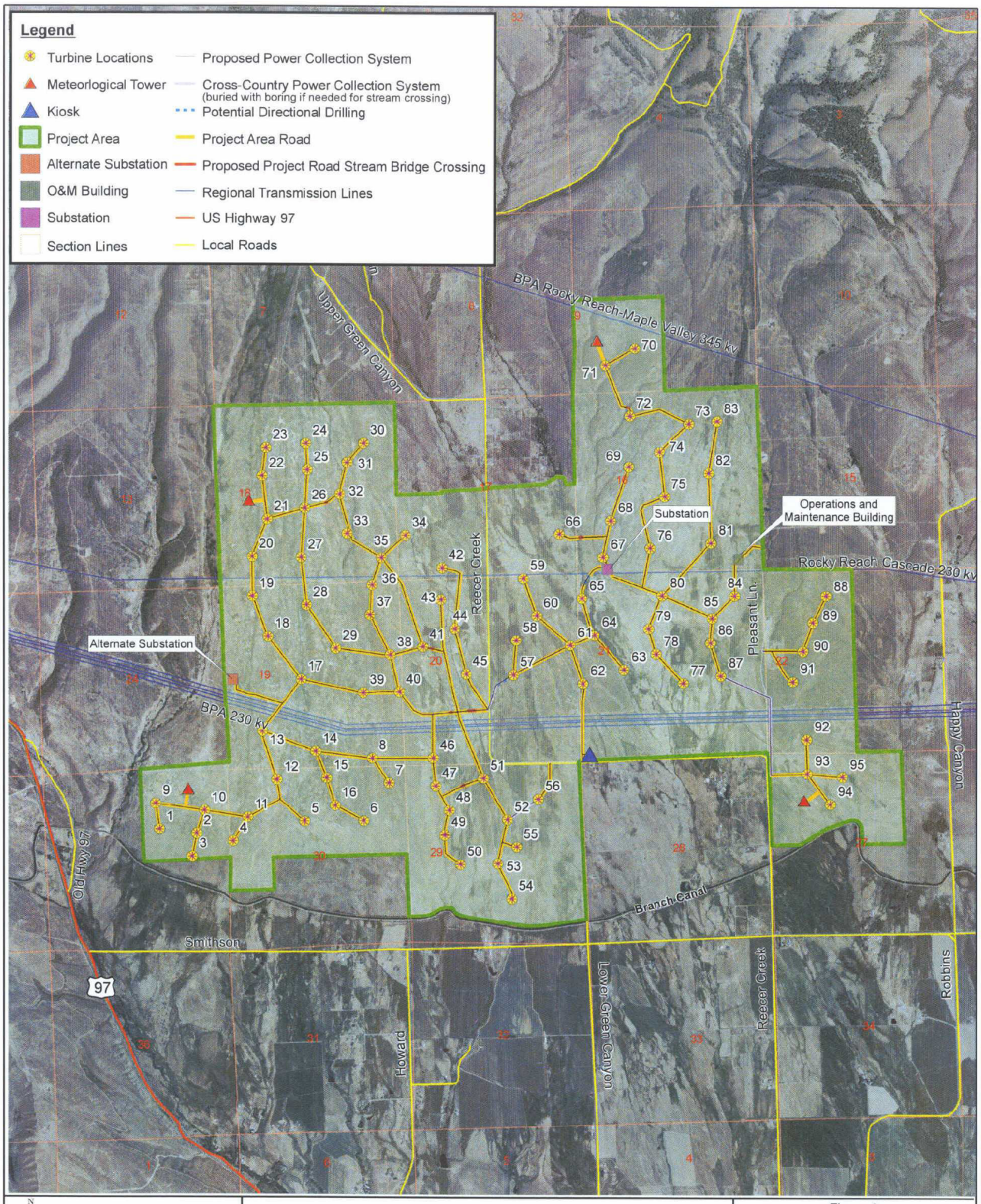
PILE TYPE FOUNDATION

Not to Scale	**DESERT CLAIM WIND POWER**	Figure 7B **TYPICAL TURBINE FOUNDATION - PILE TYPE**
Desert Claim Wind Power Kittitas County, Washington	Kittitas County, Washington	Date: 10/19/2006 | GIS Analyst: Map Source Information:



1. Nacelle
2. Heat Exchanger
3. Generator
4. Control Panel
5. Main Frame
6. Impact Noise Insulation
7. Hydraulic Parking Brake
8. Gearbox
9. Impact Noise Insulation
10. Yaw Drive
11. Yaw Drive
12. Rotor Shaft
13. Oil Cooler
14. Pitch Drive
15. Rotor Hub
16. Nose Cone

Not to Scale	**DESERT CLAIM WIND POWER**	Figure 8 **TYPICAL NACELLE CONFIGURATION**
Desert Claim Wind Power Kittitas County, Washington	Kittitas County, Washington	Date: 10/19/2006 | GIS Analyst: Map Source Information:



DESERT CLAIM WIND POWER

Kittitas County, Washington

Figure 9
Project Power Collection System

Date: 11/7/2008
GIS Analyst: avh
Map Source Information: NAIP 2006 Kittitas County

Desert Claim Wind Power
a renewable energy project by enXco

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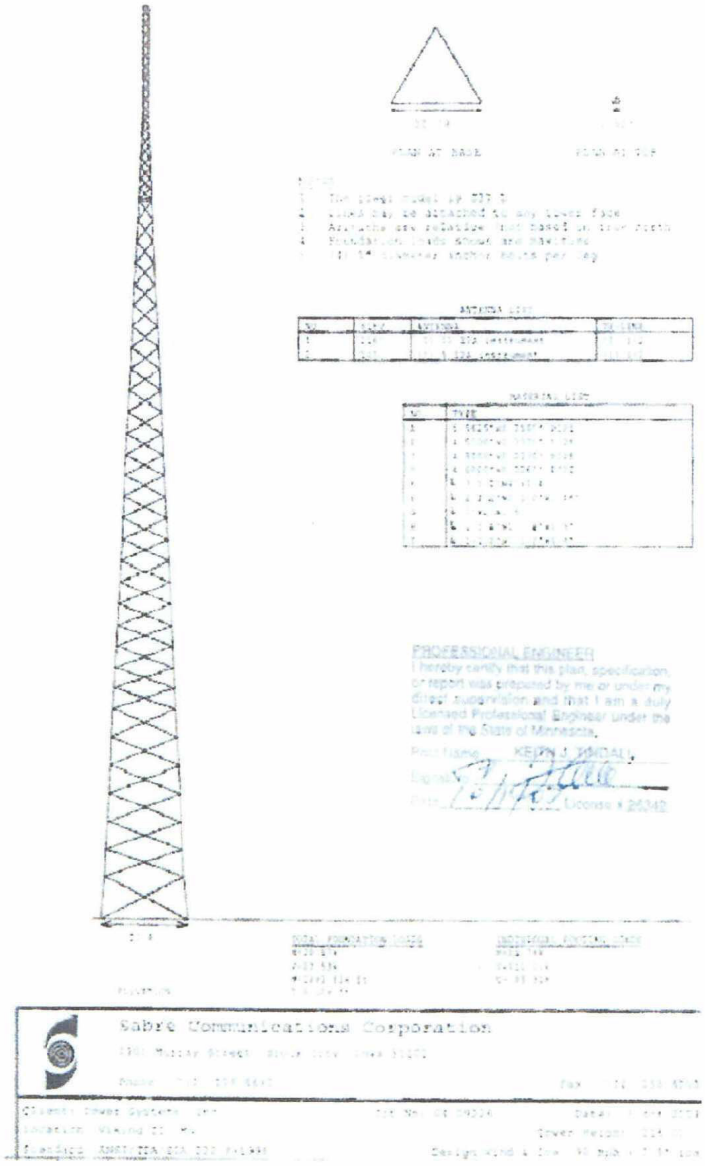
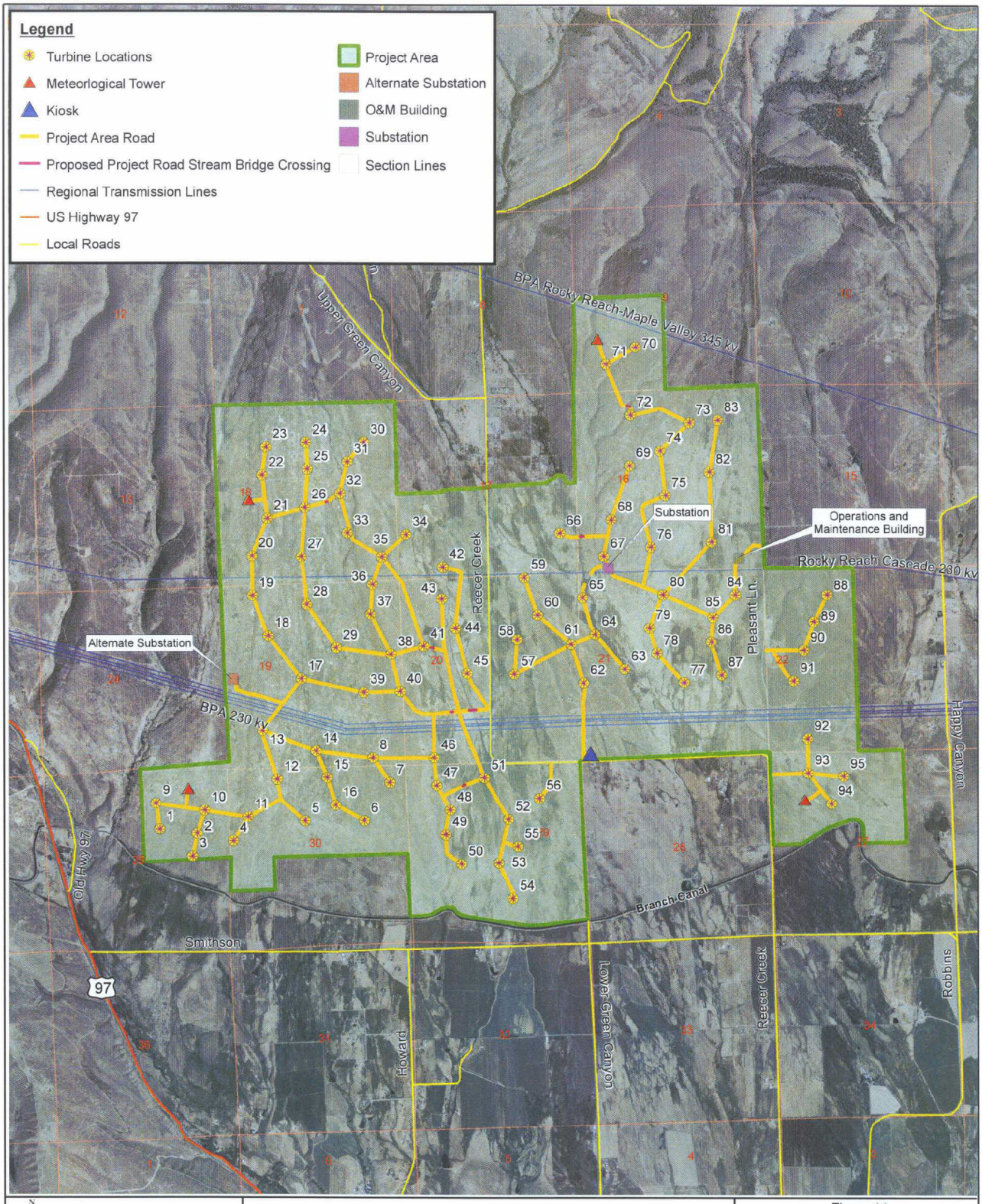


Desert Claim Wind Power Kittitas County, Washington	**DESERT CLAIM WIND POWER** Kittitas County, Washington	Figure 10 **TYPICAL PERMANENT MET TOWER** Date: 10/2/2006 | GIS Analyst: avh Map Source Information: USGS Topographic Map, 1:24,000 scale.



0 0.125 0.25 0.5 0.75 1 Miles

Scale 1:48,000

Desert Claim Wind Power

a renewable energy project by enXco

DESERT CLAIM WIND POWER

Kittitas County, Washington

Figure 11

Project Access Road System

Date: 11/7/2008	GIS Analyst: avh
Map Source Information: NAIP 2006 Kittitas County	

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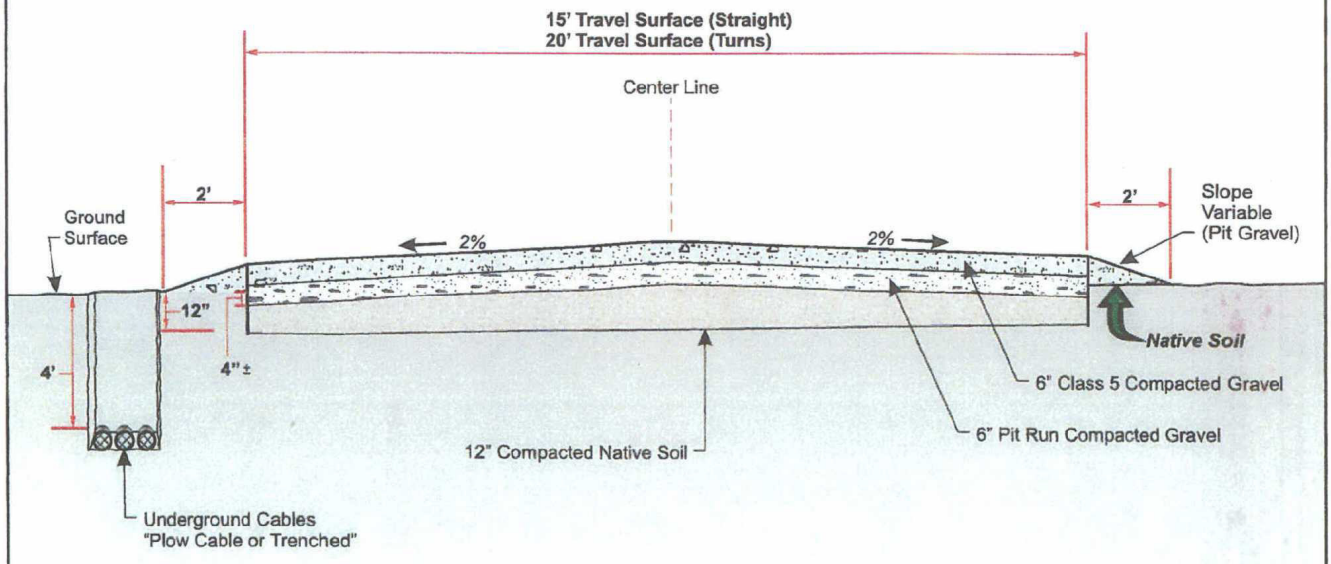
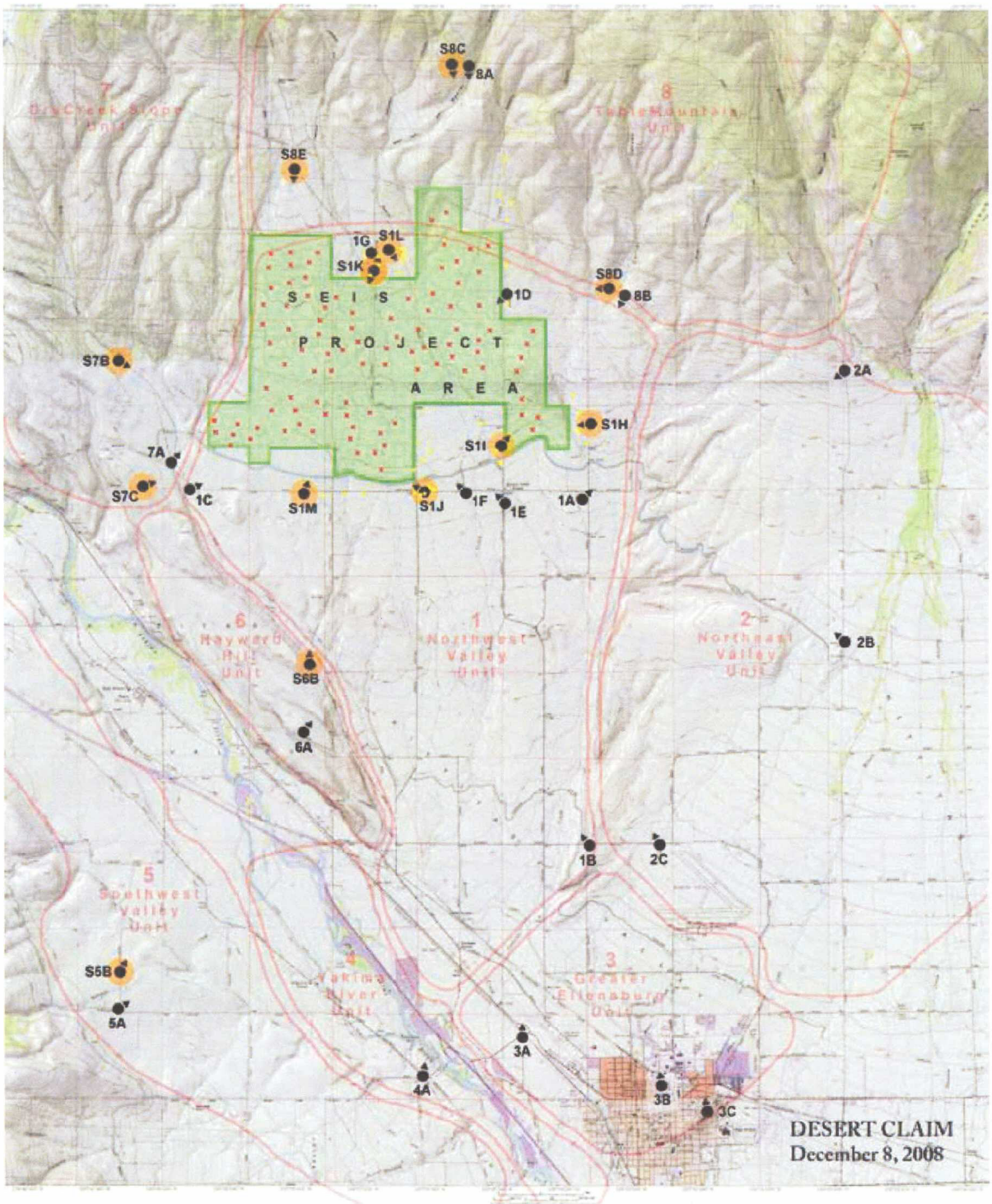


Not to Scale	**DESERT CLAIM WIND POWER**	Figure 12 **TYPICAL ACCESS ROAD CROSS SECTION**
Desert Claim Wind Power Kittitas County, Washington	Kittitas County, Washington	Date: 10/19/2006 | GIS Analyst: Map Source Information:

VISUAL SIMULATIONS

The Applicant has prepared simulated views of the current Project proposal using the REpower MM92 turbines presented in this Revised Application. The locations and directions of the viewpoints are shown on a figure preceding the simulations.



Project Area and Viewpoints

View 1B – Simulated view looking NW across the Northeast Valley Visual Assessment Unit from intersection of Hungry Junction Road and Lookabout Lane.

View 1C – Simulated view looking NE across the Northwest Valley Visual Assessment Unit along Smithson Road near U.S. Highway 97.

View 1D – Simulated view looking SW across the Northwest Valley Visual Assessment Unit from immediately N of the project area.

View S1H – Simulated view looking west-by-southwest across Northwest Valley Visual Assessment Unit from Robbins Road, just N of North Branch Canal.

View S1I – Simulated view looking NE across the Northwest Valley Visual Assessment Unit from Reecer Creek Road, just N of North Branch Canal.

View S1J – Simulated view looking west-by-northwest across Northwest Valley Visual Assessment Unit from Smithson Road, just E of Green Canyon Road.

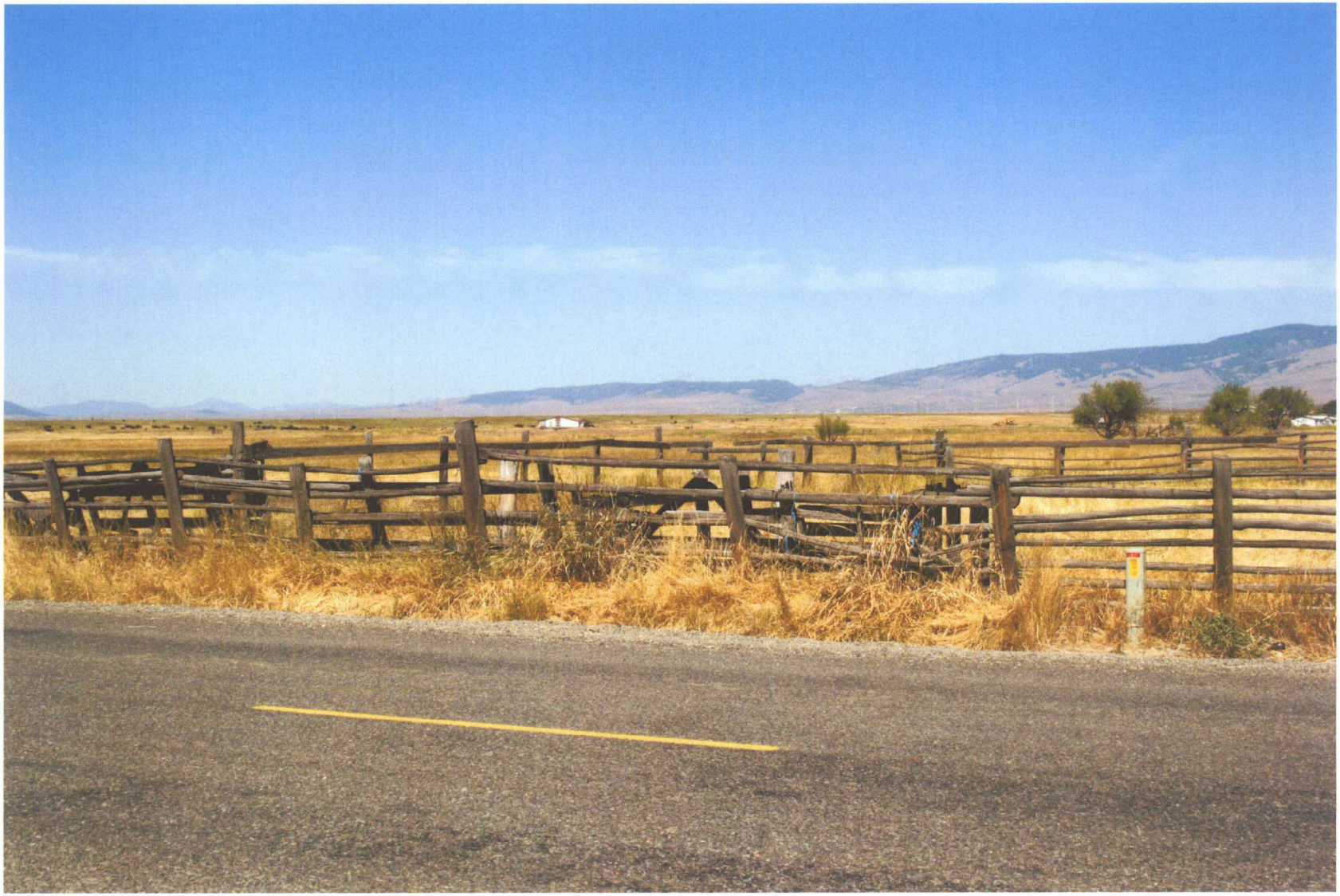
View S1K – Simulated view looking south-by-southwest across Northwest Valley Visual Assessment Unit from Reecer Creek Road, just N of the project boundary.

View S1L – Simulated view looking SE across Northwest Valley Visual Assessment Unit from Katie Ln., 1/8 mi. E of Green Canyon Rd., 1/8 mi. N of project limit.

View S1M – Simulated view looking NE across the Northwest Valley Visual Assessment Unit from Smithson Rd., ¼ mile W of Howard Rd., just south of project boundary.

View 2A –View looking SW across Northwest Valley Visual Assessment Unit from Wilson Creek Road.
Note: There are no turbines visible from this viewpoint in the current proposal.

View 2B – Simulated view looking W across the Northeast Valley Visual Assessment Unit from Wilson Creek Road on Rabbit Hill.



View 2C – Simulated view looking NW across the Northwest Valley Visual Assessment Unit from the N end of Bowers Field at Hungry Junction Road.

View 3A – Simulated view looking N across the Greater Ellensburg Visual Assessment Unit over the Burlington Northern Railroad near U.S. Hwy. 97 and Cascade Way.

View 3C – Simulated view looking NW across the Greater Ellensburg Visual Assessment Unit from Reed Park in Ellensburg.

View S5B – Simulated view looking north-by-northeast from the Southwest Valley Visual Assessment Unit ½ mile N of the intersection of Killmore Rd. and Robinson Rd.

View 6A – Simulated view NE from the Hayward Hill Visual Assessment Unit at the top of the hill.

View S6B – Simulated view looking N from above U.S. Highway 97 in the Hayward Hill Unit from a group of residences roughly two miles south of the project boundary.

View 7A – Simulated view looking NE from the Dry Creek Slope Visual Assessment Unit 1/3 mile N of Smithson Road, off U.S. Highway 97.

View S7B – Simulated view looking SW from the Dry Creek Slope Visual Assessment Unit from U.S. Hwy. 97 at driveway 16011, roughly ½ mile W of the project area.

View S7C – Simulated view looking east-by-northeast from a hilltop in Dry Creek Slope Visual Assessment Unit, 1/3 mile W of U.S. Hwy. 97, due W of Smithson Road.

View S8C – Simulated view looking S from the Table Mountain Slope Visual Assessment Unit over the Kittitas Basin, slightly west of FEIS viewpoint 8A.

View S8D – Simulated view looking west from the Table Mountain Slope Visual Assessment Unit from Robbins Road.

View S8E – Simulated view looking S from the Table Mountain Slope Visual Assessment Unit toward the Washington DNR property from Upper Green Canyon Road.

REGULATORY MATRIX

WAC Chapter 463-60 Requirement	Location of Required Information
463-60-015 Description of Applicant	Cover Letter
463-60-025 Designation of Agent	Cover Letter
463-60-075 Assurances: Insurance, Bonding and Other Arrangements	Tab 10 Revised Supplemental Regulatory Information
463-60-085(1) Mitigation Measures Summary	FEIS § 1.8
463-60-085(2) Fair Treatment	Tab 10 Revised Supplemental Regulatory Information
463-60-095 Sources of Information	Citations Provided Throughout
463-60-101 Preapplication Consultation and Public Involvement	FEIS Chapter 6 Tab 10 Supplemental Regulatory Information
463-60-125 Site Description	Tab 1 Revised Project Description
463-60-135 Legal Description and Ownership Interests	Tab 10 Revised Supplemental Regulatory Information
463-60-145 Construction on Site	Tab 1 Revised Project Description Chapter 4
463-60-155 Energy Transmission Systems	Tab 1 Revised Project Description § 3.2
463-60-165 Water Supply	Tab 1 Revised Project Description § 3.5
463-60-175 Heat Dissipation System	Not Applicable
463-60-185 Aquatic Discharge System	Not Applicable
463-60-195 Wastewater Treatment	Tab 1 Revised Project Description § 3.5
463-60-205 Spillage Prevention and Control	FEIS § 3.3
463-60-215 Surface Water Runoff	Tab 1 Revised Project Description § 4.4
463-60-225 Emission Control	Not Applicable

463-60-235 Construction and Operation Activities	Tab 1 Revised Project Description Chapters 4-5
463-60-245 Construction Management	Tab 1 Revised Project Description Chapter 4
463-60-255 Construction Methodology	Tab 1 Revised Project Description Chapter 4
463-60-265 Protection from Natural Hazards	FEIS § 3.1
463-60-275 Security	Tab 1 Revised Project Description §§ 5.1, 5.3
463-60-285 Study Schedules	Tab 10 Revised Supplemental Regulatory Information
463-60-295 Potential for Future Activities at the Site	Tab 10 Revised Supplemental Regulatory Information
463-60-296 Analysis of Alternatives	FEIS Chapter 2; *see also* SEIS
463-60-297 Pertinent Federal, State and Local Requirements	Tab 10 Revised Supplemental Regulatory Information
463-60-302 Natural Environment – Earth	FEIS § 3.1, App. A
463-60-312 Natural Environment – Air	FEIS § 3.2
463-60-322 Natural Environment – Water	FEIS § 3.3, App. B
463-60-332 Natural Environment – Habitat, Vegetation, Fish and Wildlife	FEIS § 3.4, App. C; *see also* SEIS Tab 4 Revised Supplemental Wetland and Stream Report Tab 5 Revised Supplemental Vegetation and Wildlife Report
463-60-333 Natural Environment - Wetlands	FEIS § 3.4.1; *see also* SEIS Tab 4 Revised Supplemental Wetland and Stream Report
463-60-342 Natural Environment – Energy and Natural Resources	FEIS § 3.5
463-60-352(1) Built Environment – Environmental Health - Noise	Tab 6 Revised Supplemental Sound Analysis FEIS § 3.9, App. F.

463-60-352(2)-(6) Built Environment – Environmental Health – Fire, Explosion, Releases, Safety Standards, Radiation, Emergency Plans	FEIS § 3.8
463-60-362(1) Built Environment – Land Use	FEIS § 3.7
463-60-362(2) Built Environment – Light and Glare	FEIS § 3.10 Tab 8 Revised Supplemental Shadow Flicker Analysis
463-60-362(3) Built Environment – Aesthetics	FEIS § 3.10; *see also* SEIS Tab 2 Revised Visual Simulations
463-60-362(4) Built Environment – Recreation	FEIS § 3.10
463-60-362(5) Built Environment – Historic and Cultural Preservation	FEIS § 3.6; *see also* SEIS
463-60-362(6) Built Environment – Agricultural Crops and Animals	FEIS § 3.7
463-60-372 Built Environment – Transportation	FEIS §§ 3.12, 3.13, App. H
463-60-355 Socioeconomic Impact	FEIS §§ 3.15, 3.16
463-60-536 Air emissions permits and authorizations	Not Applicable
463-60-537 Wastewater / stormwater discharge permit applications	To be supplied if needed.

ecology and environment, inc.
International Specialists in the Environment

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720 Third Ave, Suite 1700
Seattle, Washington 98104
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December 19, 2008
Mr. David Steeb
Desert Claim Wind Power LLC
P.O. Box 4
Woodinville, WA 98072

RE: Addendum - Impact Analysis to Wetlands and Streams
Desert Claim Wind Power Project, Ellensburg, Washington

Dear Mr. Steeb,

Desert Claim Wind Power LLC (Desert Claim Wind) proposes to develop a 190-megawatt wind energy facility on 5,200 acres of privately and publicly owned land in unincorporated Kittitas County, Washington. Located approximately 8 miles north of the City of Ellensburg, the proposed project would include construction of wind turbine generators, access roads, power collection system, substation, operation and maintenance building.

Ecology and Environment Inc., (E & E) reviewed the project layout map (Figure 1) of the Desert Claim wind energy facility to determine potential impacts from the turbine foundations, access roads, power collection system, and substation/maintenance building may have on wetlands, streams, and their respective buffers. We concluded that Desert Claim Wind Power has carefully micro-sited the proposed locations of the project infrastructure and our analysis shows there would be no impacts to the onsite sensitive areas.

E & E performed wetland and stream surveys during the Kittitas County FEIS process in June and July 2003. Additional surveys were conducted on Washington Department of Natural Resources land in June 2006 and on private land in July 2008. The sections below discuss the affected environment of wetlands and streams within the proposed project area and the impact analysis on those resources from the proposed project.

Affected Environment

The proposed project area is located within the central portion of the Upper Yakima River drainage basin. The Yakima River begins on the eastern slope of the Cascade Mountains at Keechelus Lake in the Upper Kittitas Valley and flows southeasterly through the lower plateau and river-bottom lands to the Columbia River, draining an area of approximately 6,155 square miles.

The region surrounding the proposed project area is comprised predominately of upland environment and can be described as open country with shrub-steppe-covered rolling hills and flats. Typically, the dry environment of eastern Washington limits wetland areas to the immediate vicinity of perennial streams, seeps, and springs.

Streams

Streams located within the project area drain into the Yakima River, upstream of Ellensburg and approximately 40 miles downstream of the river's headwaters. Because the Yakima River Basin receives little direct precipitation (8.9 inches per year), these streams are primarily fed by the snowmelt of the ridges to the north of the project area (WRCC 2007).

Within the project area, 21 streams were identified, evaluated, and delineated. Of these streams, seven were classified as Type 3 streams (segments of natural waters which are not classified as Type 1 or 2 and have a moderate to slight fish, wildlife, or human use). The remaining 14 streams were classified as Type 4 streams (segments of natural waters within Kittitas County which are not classified as Type 1, 2, or 3 waters, and have a channel width of two feet or more between the ordinary high water marks) and Type 5 (segments of natural water within Kittitas County which are not classified as Type 1, 2, 3, or 4 waters, and have a channel width of two feet between the ordinary high water marks, including streams with or without well-defined channels). Type 4 and 5 streams are not truly waters, but are waterways which are intermittent in nature and may be dry beds at any time of the year. According to the Kittitas County Critical Areas Ordinance (KCCAO), the buffer width for Type 3 streams is 50 feet and Type 4 and 5 streams are 15 feet. The ordinance does not classify irrigation ditches, waste ways, drains, outfalls, operational spillways, channels, stormwater runoff facilities, or other wholly artificial watercourses as streams (Kittitas County 2007). For more detailed information regarding the stream inventory, refer to the Desert Claim Wind Power FEIS 2004 (Appendix B Stream and Wetland Delineation Report.)

Wetlands

Wetlands features within the area were identified and evaluated, and the wetland boundaries were delineated. Within the project area, a total of 67 wetlands were identified.

Of the 67 wetlands, 65 were classified as Category III wetlands. Category III wetlands are those that do not satisfy categories I, II, or IV criteria, and have a habitat value rating of 21 points or less. According to the KCCAO, these wetlands have a buffer of 80 feet. For more detailed information regarding the wetland delineation, refer to the Desert Claim Wind Power FEIS 2004 (Appendix B Stream and Wetland Delineation Report.)

Two wetlands were classified as Category IV according to the classification defined in the KCCAO. Category IV wetlands are: i) hydrologically isolated wetlands that are less than or equal to one acre in size, have only one wetland class, and are dominated (greater than 80 percent aerial cover) by a single non-native plant species; or ii) hydrologically isolated wetlands that are less than or equal to two acres in size, have only one wetland class, and greater than 90 percent aerial cover of non-native plant species. According to the KCCAO, Category IV wetlands have a buffer width of 25 feet.

Impact Analysis

The analyses of temporary and permanent impacts from the proposed project are based on the facility layout completed in September 2008 (Figure 1).

Streams

Potential impacts to streams and stream buffers, as a result of construction activities, could include disturbance of the streambed and banks, disturbance to or removal of riparian vegetation adjacent to stream banks, potential filling in or relocation of parts of the ephemeral or intermittent streams, and erosion and sedimentation which could degrade water quality.

There are six Type 3 stream or irrigation ditches crossings for access roads and the power collection system. To eliminate potential impacts to these streams and their associated buffers, road crossings would be permanently bridged. In locations where the power collection system intersects these water bodies, crossings would occur either by bore under the water body, or cross over it via bridge crossings or power poles, completely avoiding impacts to streams and their buffers.

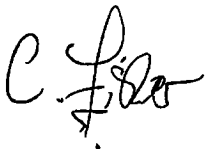
Based upon this analysis, there would be no temporary or permanent impacts to any streams or stream buffers from turbine pads, access roads, or the power collection system.

Wetlands

Potential impacts to wetlands and their buffers as a result of construction activities could include removal of wetland or buffer vegetation, potential filling of the wetland, soil compaction from heavy equipment, and erosion and sedimentation which could degrade water quality.

There are two wetland crossings for the power collection system. To eliminate potential impacts as a result of these wetland crossings, crossings would occur via a bore under the wetlands, or cross over via bridge crossings or by power poles, to avoid impacts. By implementing these measures, our analysis concludes there would be no temporary or permanent impacts to wetlands or their buffers from turbine pads, access roads, or the power collection system.

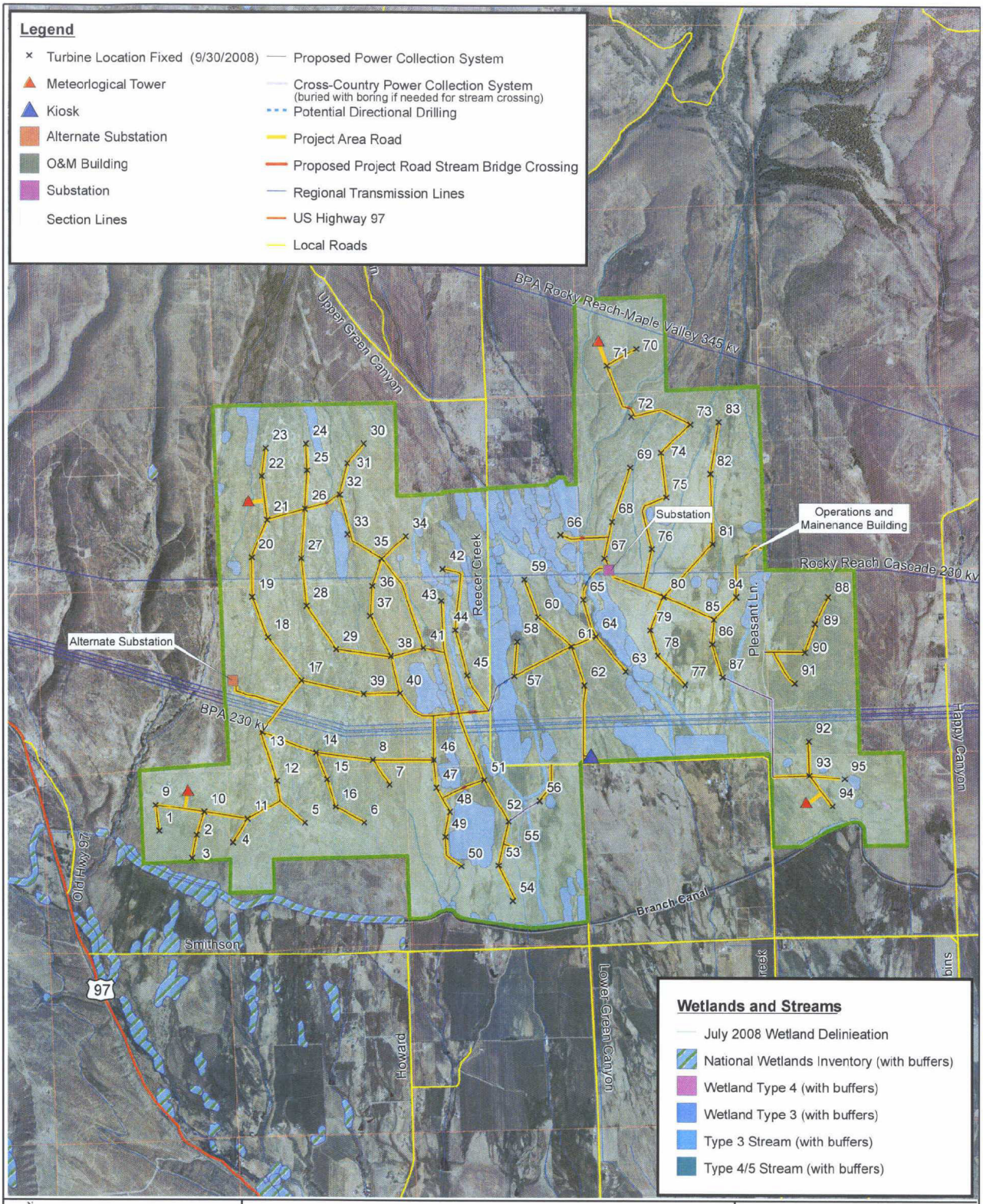
Sincerely,
ECOLOGY AND ENVIRONMENT, INC.



Cameron Fisher, Senior Biologist
E & E Seattle

Attachment

Cc: N. Roster, E & E Portland
R. Weinman, Seattle



DESERT CLAIM WIND POWER

Kittitas County, Washington

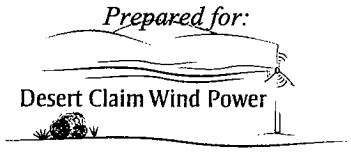
Figure 1
Wetlands and Streams within the Project Area

Date: 9/30/2008	GIS Analyst: avh
Map Source Information: NAIP 2006 Kittitas County	

...\desert_claim\turbine_layout_7-24-08\figures\figure wetlands with project features with ownership.mxd

Update on Vegetation and Wildlife Impacts from the New Desert Claim Project Area

January 22, 2009



Desert Claim Wind Power, LLC
Ellensburg, Washington

Prepared by:

David Young and Victoria Poulton

WEST, Inc.

Western EcoSystems Technology, Inc.
2003 Central Ave
Cheyenne, WY 82009

INTRODUCTION

Desert Claim Wind Power, LLC, is submitting a revised Application for Site Certification (ASC) to the Washington State Energy Facility Site Evaluation Counsel (EFSEC) for the Desert Claim Wind Power Project (the Project). The Project is a renewable wind energy generation facility that will consist of up to 95 wind turbines and have a nameplate capacity of up to 190 megawatts (MW). The Project will be located within an area of approximately 5,200 acres in unincorporated Kittitas County, approximately 8 miles northwest of Ellensburg, Washington. The current proposal is a modified version of the Project evaluated by Kittitas County in the August 2004 Desert Claim Final Environmental Impact Statement.

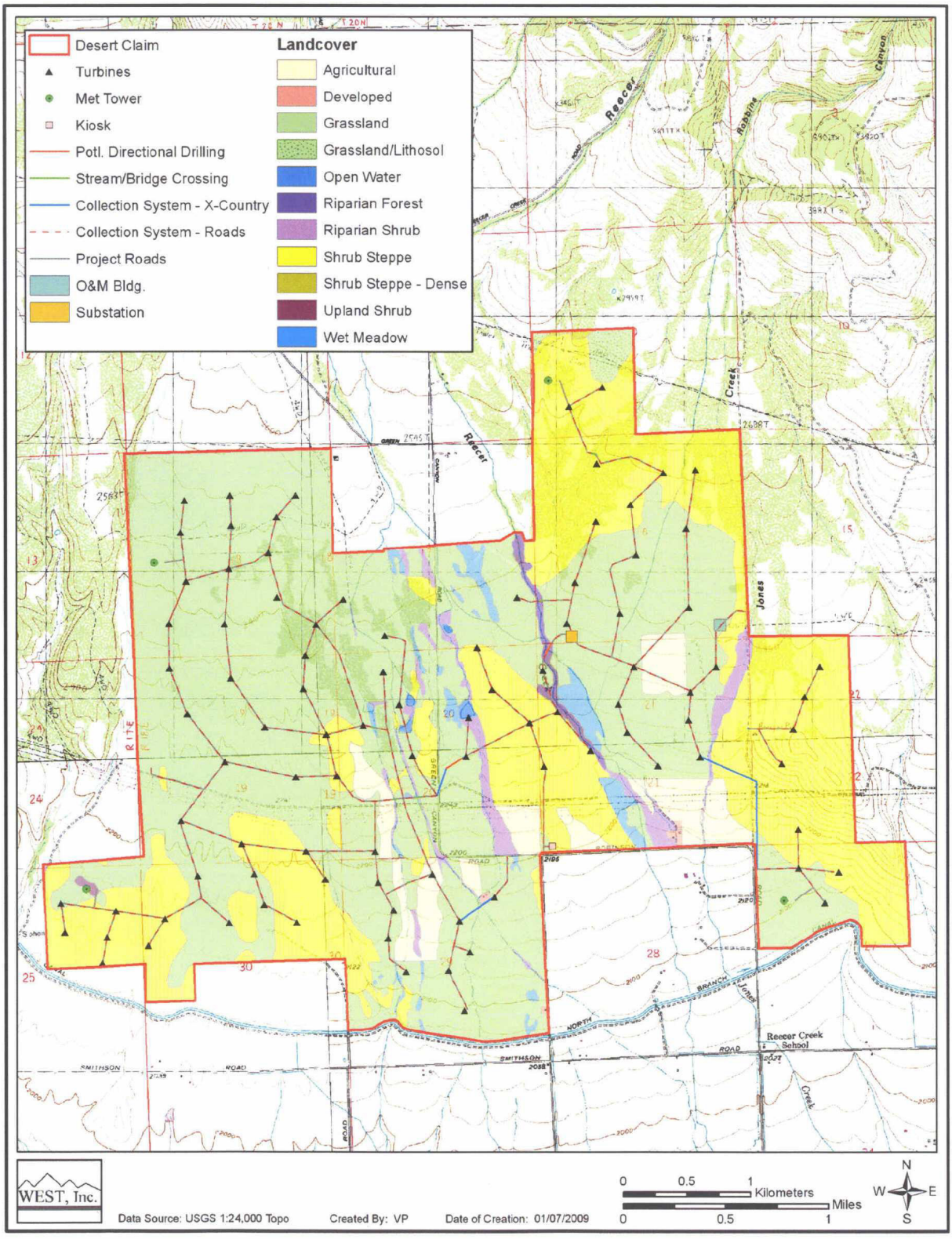
Following Desert Claim's submission of an Application for Site Certification in November 2006, EFSEC retained Golder Associates to review the Application for Site Certification and advise the Council regarding SEPA compliance. (Golder 2007) Golder's report identified three questions related to biological resources: (1) whether, based on new information, the level of potential impacts to birds could be greater than predicted in the County FEIS; (2) whether, based on the methods for analyses, potential impacts to bats could be greater than predicted in the County FEIS, and (3) whether additional information was needed to determine the significance of impacts to vegetation. This report contains updated estimates of impacts to vegetation, birds and bats. Based on this updated information, it concludes that the Desert Claim Project will not result in significant adverse effects on bird and bat populations, and further that the potential cumulative effects of the Desert Claim Project and other wind projects that have been permitted in Kittitas County will not be significant.

PROJECT DESCRIPTION

The revised Project area is a contiguous block of land that significantly overlaps the previous portions of the project area (**Figure 1**). The most significant change in location of the Project is that the areas in the southeast of the original project area have been omitted, and new areas have been added in the east, northeast, and west.

The total capacity for the Project has been revised upward 10 MW for a total of 190 MW. The turbine now proposed to be used is slightly larger than those previously considered. The REpower MM92, a 2.0 MW nameplate capacity turbine, is now being considered for the Project. While this particular turbine was not discussed in the DEIS, another 2-MW turbine (Vestas) was considered in the DEIS. The REpower MM92 has a rotor diameter of 92.5 m (304 ft) and hub height of 78.5 m (258 ft), resulting in a maximum blade reach (blade tip height at highest position) of 124.8 m (~410 ft.). In the DEIS, a maximum turbine envelope with a maximum blade height of 120 m (393ft) was used that covered each of the wind turbine models that were being considered. The maximum blade height of the turbine now being considered is slightly taller (124.8 m) than the reach considered (393 ft) in the DEIS. This results in a larger rotor-swept area (RSA) of 6,717 m^2, compared to 6,050 m^2 in the 2004 DEIS; however, the project footprint is reduced since fewer turbines are now being proposed (95 compared to 120 in the 2004 DEIS).

Figure 1
Vegetation Mapping of the revised Desert Claim Wind Power Project



VEGETATION

Existing Project Area Vegetation

Vegetation in the original Project area was mapped according to vegetation types characterized by the dominant plants (Young et al. 2003a). This mapping was updated in fall 2006 and again in fall 2008 based on the revised Project area, the results of vegetation mapping in the surrounding areas, aerial photography and a ground survey. The revised Project area includes parcels totaling 5,200 acres, including a combination of private property and land leased from DNR. Based on the new project area and updated vegetation mapping, habitat acreages in the Project area were revised (**Table 1**).

Vegetation in the Project area was classified into ten types (**Table 1, Figure 2**). The primary vegetation type is grassland, covering over half of the Project area (57.3%), primarily in the western and central parcels. Shrub-steppe is the second most common vegetation type (32.7% of the Project area), followed by agricultural areas (4.7%). For the purposes of the vegetation map, the agricultural areas consisted of those areas where the vegetation is actively managed (e.g., irrigated and/or mowed) for agricultural purposes; however, the shrub-steppe and grassland types are also used for agriculture (i.e., cattle grazing). Other vegetation types mapped in the Project area include grassland/lithosol (0.6%), riparian shrub (2.1%), wet meadow (1.7%), riparian forest (0.6%), open water (0.2%), and developed (0.1%).

The Project area has been decreased by approximately 37 acres from the previous project area identified in the 2004 FEIS. The descriptions of the different types of vegetation found in the EIS have not changed, but pine forest does not occur in the new Project area.

Table 1
Vegetation Types in the Project Area

Vegetation Type	Approx. Acres[1]	Percent of Project Area	General Habitat Description
Agricultural	245.4	4.7	Agricultural areas are sites used for irrigated hay meadows that are periodically mowed.
Developed	5.9	0.1	Areas where human activity has removed or altered natural vegetation, such as residential homes and farm buildings and yards.
Grassland	2981.9	57.3	Areas dominated by grass species, primarily bunchgrasses bluebunch wheatgrass, Sandberg's bluegrass, cheatgrass, and bulbous bluegrass.
Grassland/ Lithosol	30.7	0.6	A subset of the grassland habitat type found on exposed ridges in shallow soils (lithosol) in the northern-most parcel. Sparse grasses (Sandberg's bluegrass) dominate, along with scattered forbs and occasional shrubs.
Open Water	7.9	0.2	Areas of open water including natural ponds, stock ponds, and the irrigation canal.
Riparian Forest	30.7	0.6	Riparian zones dominated by trees and tall shrubs, located in drainages with perennial or intermittent streams. The dominant species include cottonwoods and various willows. In some locations, the shrub understory is very dense, limiting herbaceous growth.
Riparian Shrub	109.8	2.1	Riparian areas adjacent to streams or irrigation ditches where shrubs are common, but often scattered. Common shrub species include black hawthorn and coyote willow. Various herbaceous species are present in the understory. Weedy species, including and knapweed were often observed.
Shrub Steppe	1701.7	32.7	Upland areas dominated by shrubs, primarily bitterbrush and rigid sagebrush, with an understory of mixed grasses and forbs. Four acres of hawthorne are also included in this category but are not impacted by planned facilities. A few weedy species, such as cheatgrass and knapweed, were observed, but weedy species in general were not found over large extents of the area.
Wet Meadow	86.1	1.7	Areas dominated by hydrophytic vegetation, including various sedges, grasses, and rushes and other herbaceous species. These areas appear to be saturated or inundated most of the year, either from leakage from the irrigation canal or stockponds, or due to high groundwater in low spots and swales. Weeds were observed in some of the wet meadows, primarily chicory.
Total	5200	100	

[1] Approximate acreage totals based on GIS mapping and calculations.

Vegetation Impacts

Based on GIS analysis of the latest proposed Project layout, an estimated 86.4 acres of vegetation in the Project area would be permanently occupied by Project facilities and an additional 230.8 acres would be temporarily disturbed (**Table 2**). These calculations do not account for Project facilities that have not yet been sited, including construction staging and storage areas, which would likely add approximately 19.5 acres of disturbed area. Most facilities would be located in grassland and shrub-steppe habitat types. An estimated 23.04 acres of shrub-steppe would be permanently impacted. An estimated 58.12 acres of grassland (including the grassland/lithosol type) would be permanently impacted. In addition, an estimated 2.19 acres of agricultural lands would be permanently impacted, as well as 0.71 acres of riparian forest, 0.30 acres of riparian shrub, 0.21 acres of open water, and 0.18 acres of wet meadow. Desert Claim, working with their wetlands consultant, has adjusted (micro-siting) the layout in the areas of the potential wetlands to avoid impacts to this resource. Of the disturbed areas, the access roads account for most of the permanent impacts to vegetation (71.5 acres).

The total acres of temporary and permanent impact are slightly less with the new layout than the previous layout (see Table 3.4-2, page 3-65 of FEIS).

Rare Plants

There were no known populations of rare plant species within the previous project area. For purpose of this discussion, rare species include federally listed endangered, threatened, proposed, or candidate plant species and Washington State endangered, threatened, sensitive, or review plant species. Given the overlap of the previous project area with the revised Project area, and the similarity between the vegetation types of the revised Project area with the original project area, no Project-related impacts are anticipated to rare plant species with the revised Project.

Table 2
Approximate Acres of Impact by Facility Type

FACILITY	VEGETATION TYPE	APPROXIMATE ACRES OF IMPACT TEMPORARY	PERMANENT
Turbines[a]	Agricultural	1.12	0.11
	Developed	<0.01	0.00
	Grassland	64.29	6.82
	Grassland/Lithosol	<0.01	0.00
	Open Water	0.59	0.09
	Riparian Forest	0.84	0.03
	Riparian Shrub	0.45	0.02
	Shrub Steppe	31.29	3.42
	TOTAL	*98.60*	*10.50*
Access Roads[b]	Agricultural	5.59	2.13
	Grassland	127.03	48.31
	Open Water	0.35	0.13
	Riparian Forest	1.91	0.70
	Riparian Shrub	0.77	0.28
	Shrub Steppe	52.07	19.77
	Wet Meadow	0.48	0.18
	TOTAL	*188.20*	71.50
Collection System	Agricultural	0.09	0.00
Buried Along Project Roads[c]	Grassland	2.10	<0.01
	Open Water	<0.01	0.00
	Riparian Forest	0.03	0.00
	Riparian Shrub	0.01	0.00
	Shrub Steppe	0.86	<0.01
	Wet Meadow	<0.01	0.00
	TOTAL	*3.11*	*<0.10*
Buried Cross-Country	Developed	0.02	0.00
	Grassland	0.35	<0.01
	Riparian Shrub	0.01	0.00
	Shrub Steppe	0.31	<0.01
	TOTAL	*0.69*	*<0.10*
Met Towers	Grassland	*0.30*	*0.07*
	Shrub Steppe	*0.10*	*0.03*
	TOTAL	*0.40*	*0.10*
Construction Staging/Storage		(19.5)	-
Substation	Grassland	2.80	2.00
O&M Facility	Grassland	2.72	1.94
	Shrub Steppe	0.08	0.06
	TOTAL	*2.80*	*2.00*
Kiosk	Grassland	0.19	0.00
	Shrub Steppe	0.81	0.30
	TOTAL	*1.00*	*0.30*
Total		**317.20**	**86.40**

[a] Assumes construction disturbance for each turbine pad and transformer will temporarily affect a 120-ft radius around the tower (~1 acre); area of permanent impact based on a 39-ft radius tower pad (0.11 acre).

[b] Assumes a 50-ft wide temporary disturbance corridor and a 20-ft wide permanent disturbance corridor. A 115% factor applied to account for increase curves and intersections which are larger than the standard road.

[c] For buried collection system an 5-ft wide temporary disturbance corridor was used with residual permanent impacts diminishing over time through reclamation and an 85% reduction factor applied for temporary disturbance that would occur along roads and within road disturbance.

WILDLIFE

The following sections describe impacts to wildlife, birds and bats, from the revised Project, focusing on anticipated changes to impacts from the previous layout and potential cumulative effects from other wind projects in Kittitas County. In addition, the analysis incorporates new information that has become available since the 2003 impact assessment. When the FEIS was prepared in 2003-2004, biologists typically estimated impacts based on per turbine fatality rates developed from studies at similar projects. Because of large differences in turbine sizes among various projects and the availability of more project data, biologists have now begun to use a different approach. The approach is to standardize data on a per MW basis for predicting fatality impacts. This approach assumes that the mortality rates are proportional to the MW capacity of the turbine, which is nearly equivalent to assuming mortality is proportional to the rotor-swept area of the turbine. This analysis uses the turbine MW nameplate capacity.

Birds

Construction Impacts

Wind plant construction could affect birds through loss of habitat, potential fatalities from construction equipment, and disturbance/displacement effects from construction and human occupation of the area. Habitat impacts are slightly less compared to the 2004 FEIS since the number of turbines has been reduced, thereby reducing the overall footprint of turbine pads and associated facilities. Consequently, potential impacts from construction equipment and disturbance/displacement effects will likely be slightly lower than the previous proposal, due to the smaller number of turbines and less time needed to complete the project. Potential mortality from construction equipment on site is expected to be low and similar to other wind projects. The risk of bird mortality from construction is most likely limited to potential destruction of a nest with eggs or young for ground- and shrub-nesting species when equipment initially disturbs the habitat. Because less native vegetation will be disturbed with the new Project, the risk of destruction of a nest with eggs or young will be lower. Disturbance-type impacts can be expected to occur if construction activity occurs near an active nest or primary foraging area.

Impacts to Nesting Raptors

Based on the previous avian studies, raptor nest density in the original project area and within a 2-mile buffer of the site for buteos was 0.28 nest/mi^2 (0.11 nest/km^2) and for all raptors was 0.34 nest/mi^2 (0.13 nest/km^2). Raptor nest density around the new proposal, including a 2-mile buffer, for buteos is 0.18 nest/mi^2 (0.07 nest/km^2) and for all raptors is 0.20 nest/mi^2 (0.08 nest/km^2). The best raptor nesting habitat in the Project vicinity is

located along the Wilson creek riparian corridor east of the site and along the numerous transmission lines within the project area. Nests closer to proposed turbines within the site are more likely to be affected by Project activities and may experience disturbance or displacement effects to the point that raptors do not return and use those nests. This potential impact will decrease with the new proposal due to the lower nest density in this area. There were only 2 active raptor nests, based on the 2003 survey, within 0.5 mile of the new Project boundary (2 red-tailed hawks). Higher nest densities occurred in the south east area of the original project and that area has been dropped from the Project. Also, Wilson Creek falls outside the 2-mile buffer of the new site. It is unlikely that construction of the new Project will result in significant disturbance or displacement impacts on nesting raptors.

Estimates of Mortality Due to Turbines

Mortality impacts of the proposed Project are projected primarily based on data collected at 11 existing regional wind power facilities (**Table 3**): the Combine Hills project, Oregon (Young et al. 2005), the Klondike I and II projects, Oregon (Johnson et al. 2003, NWC and WEST, 2007); the Vansycle Wind Plant, Oregon (Erickson et al. 2000); the Stateline Wind Project, Washington and Oregon (Erickson et al. 2003a); Hopkins Ridge project, Washington (Young et al. 2007), Nine Canyon Wind Project, Washington, (Erickson et al. 2003b), the Wild Horse project, Washington, (Erickson et al. 2008), Bighorn I, Washington, (Kronner et al. 2008), Leaning Juniper, Oregon (Kronner et al. 2007), and the Condon project (Fishman 2003). Monitoring studies at these projects were all similar in scope and the mortality estimates were adjusted for bird and bat carcass removal and searcher efficiency biases at all projects except Condon.

Based on the avian studies performed by WEST in 2002-2003, use by birds of the Project area is similar to other wind plants studied (**Table 3**). Species diversity of the site was higher than some other studies, but overall avian use estimates were similar. Collision-related impacts (fatalities) would not be expected to exceed what has been observed at other wind projects in the northwest.

Raptors

Compared to other wind projects studied in the region, raptor (defined as buteos, accipiters, eagles, falcons) use for the Desert Claim site was slightly above average, with the equivalent of 0.72 raptors observed for a 20-minute survey. The majority of the raptor sightings were red-tailed hawks during the spring, summer, and fall, and rough-legged hawks during the winter. Raptor mortality for the 11 wind projects listed above in Washington and Oregon has ranged from 0 to 0.15 fatalities per MW per year (**Table 3**), with an average of 0.07 fatalities per MW per year. Considering these mortality results and raptor use estimates at these wind projects, it is estimated that potential raptor mortality at the proposed Project could be higher than average. Using the raptor mortality rates from projects in the region, potential raptor mortality is expected to range from 0 to 29 per year.

Table 3
Avian use estimates and avian fatality estimates for wind power projects in the Columbia Plateau Ecoregion.

Project	Mean annual avian use (#/20-min survey)		Mean annual mortality (#/MW/year)			
	Raptors	All birds	Raptors	All birds	Nocturnal Migrants	Source
Combine Hills, OR	0.60	6.0	0	2.6	0.27	Young et al. 2005
Klondike, I OR	0.47	17.5	0	0.9	0.35	Johnson et al. 2003
Klondike II, OR	0.47	17.5	0.11	3.1	2.11	NWC and WEST, 2007
Vansycle, OR	0.41	13.1	0	1.0	0.32	Erickson et al. 2000
Stateline, WA/OR	0.41	13.1	0.10	2.4	0.78	Erickson et al. 2004, 2007
Hopkins Ridge, WA	0.64	8.7	0.14	1.2	0.46	Young et al. 2007
Nine Canyon, WA	0.26	9.4	0.05	2.8	0.45	Erickson et al. 2003b
Wild Horse, WA	0.40	5.0	0.09	1.6	0.88	Erickson et al. 2008
Bighorn I, WA	0.90	16.6	0.15	2.6	0.57	Kronner et al. 2008
Leaning Juniper, OR	0.52	23.6	0.06	3.2	na	Kronner et al. 2007
Condon, OR	0.37	5.8	0.02[a]	0.05[a]	NR	Fishman Ecological Services 2003
Mean	**0.50**	**12.4**	**0.07**	**2.1**	**0.69**	

[a] not adjusted for searcher efficiency or scavenger removal; study methods differed from other projects and were not as rigorous; therefore this estimate should be regarded as a minimum mortality estimate and it was not used in calculation of the mean values.

A more recent analysis of results from multiple projects (**Figure 4**), including numerous studies in the Columbia Plateau region, suggests that there is a correlation between raptor use and raptor mortality. The relationship between raptor use (standardized to 20-minute surveys) and raptor mortality (adjusted for site-specific estimates of carcass removal and searcher efficiency) was plotted (**Figure 4**) for 13 wind projects studied since 2002. A strong relationship is apparent in this analysis. Two California projects (High Winds and Diablo Winds) have very high raptor use, and much higher raptor mortality than Pacific Northwest and Mid-west projects (**Figure 4**). Raptor use in this analysis does not include vultures. Raptor use at Desert Claim was analyzed to include just the first 20 minutes of surveys (Young et al. 2003) and to exclude turkey vultures so that it could be accurately compared to the regression.

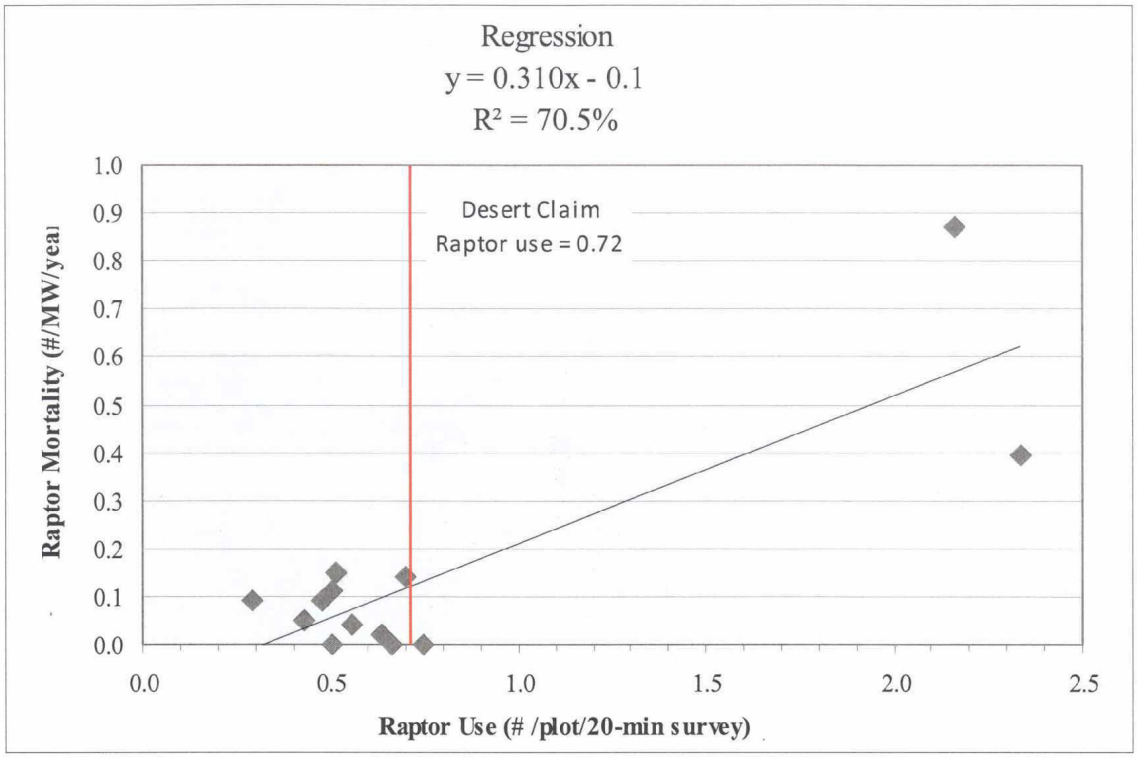


Figure 4. Relationship between raptor use and mortality for 13 wind projects studied since 2002.

Data sources:

Study and Location	Raptor Use	Source	Raptor Mortality	Source
Buffalo Ridge, MN	0.64	Erickson et al. 2002	0.02	Johnson et al. 2000
Combine Hills, OR	0.75	Young et al. 2003c	0.00	Young et al. 2005
Diablo Winds, CA	2.16	WEST 2006a	0.87	WEST 2006a
Foote Creek Rim, WY	0.55	Erickson et al. 2002	0.04	Young et al. 2003b
High Winds, CA	2.34	Kerlinger et al. 2005	0.39	Kerlinger et al. 2006
Hopkins Ridge, WA	0.70	Young et al. 2003d	0.14	Young et al. 2007
Klondike II, OR	0.50	Johnson 2004	0.11	NWC and WEST 2007
Klondike, OR	0.50	Johnson et al. 2002	0.00	Johnson et al. 2003
Stateline, WA/OR	0.48	Erickson et al. 2002	0.09	Erickson et al. 2002
Vansycle, OR	0.66	WCIA and WEST 1997	0.00	Erickson et al. 2002
Big Horn, WA	0.51	Kronner et al. 2008a	0.15	Kronner et al. 2008b
Wild Horse, WA	0.29	Erickson et al. 2003c	0.09	Erickson et al. 2008
Nine Canyon, WA	0.43	Erickson et al. 2002	0.05	Erickson et al. 2003b

Using this method, estimated raptor use for Desert Claim (0.72/survey) yields a prediction of 0.12 raptor fatalities/MW/year from this regression model, or 23 raptors for the entire project, which is in the range predicted based solely on fatality rates at the other regional projects (Table 3).

These estimates would not result in any population level consequences (e.g., within the Kittitas Valley, within the Columbia Plateau, or some larger population) for the species likely to be impacted. For example, most fatalities are likely to be red-tailed hawks and American kestrels, and these two species are the most common raptor in the Kittitas Valley, as well as in the Columbia Plateau and nationally. Based on results data from the USGS Breeding Bird Survey (BBS) routes in the Columbia Plateau over the past 20 years (Sauer et al. 2006), the breeding populations for these two species in the Columbia Plateau is approximately 5,890 kestrels and 7,035 red-tailed hawks in the ecoregion (see Cumulative and Population Level Impacts below). Based on the estimated raptor fatality rate above of 23 raptors, and assuming that half are kestrels (12 individuals) and half are red-tailed hawks (12 individuals), then 0.20% of the kestrel population and 0.17% of the red-tail population would be directly impacted by the Project on an annual basis.

Passerines

Passerines have been the most abundant fatalities at other wind projects studied, often composing more than 80 percent of total avian mortality. Both migrant and resident passerine fatalities have been observed. Given that passerines make up the vast majority of avian observations on-site, it is expected that passerines would make up the largest proportion of fatalities. As with raptor fatality estimates, biologists now generally estimate passerine mortality for wind projects on a per MW rather than a per turbine basis. Considering the available data from existing regional wind projects and the fact that passerines make up approximately 70% of bird fatalities at wind projects in the Pacific Northwest (**Table 4**), it is estimated that potential passerine mortality at the proposed Project would be approximately 1.47 birds per MW per year. This would result in approximately 280 passerine fatalities per year at the Project if 190 MW are constructed. The range of mortality rates from northwest projects (Table 3), leads to an estimate of between approximately 50 to 400 passerine fatalities would occur annually at the project.

Table 4
Percent composition of avian fatalities by species group for existing Columbia Plateau Ecoregion (WA, OR) wind-energy facilities.

Species	Number of Fatalities	Percent Composition
Passerines	461	69.5
Upland gamebirds	96	14.5
Raptors	57	8.6
Doves/pigeons	21	3.2
Waterbirds/waterfowl/shorebirds	11	1.7
Other birds[a]	17	2.6
Totals	**663**	**100**

[a] woodpeckers, nighthawks, swifts

Waterfowl

Little waterfowl mortality has been documented at other wind plants. The most common waterfowl species observed in the Project area were mallard, Canada goose, and northern pintail, and were seen mainly in winter. A variety of other waterfowl species were seen incidentally in the study area. Waterfowl mortality could be expected, likely composed mostly of mallards; however, the total number of anticipated fatalities is low. While mallards were seen year round, the majority of waterfowl use was during winter and in the western portions of the original project area. Potential impacts to waterfowl would not be expected to change based on the new proposal because the portion of the original project not included in the current proposal was primarily shrub-steppe vegetation which had little waterfowl use.

All Avian Mortality

The range of bird mortality for the 10 regional wind projects listed above where fatality counts were adjusted for bias (searcher efficiency, carcass removal) is approximately 0.9 to 3.2 birds per MW per year for all birds with an average of 2.1 birds per MW per year (**Table 3**). Using this range, avian mortality at the proposed Project would be approximately 171 to 608 birds per year if 190 MW are built. Since the total MW has increased by 10 MW, this approach yields a slightly higher avian mortality estimate for the new Project than would have been predicted for the original project proposal.

Carcass searches at other wind projects have found avian fatalities associated with guyed met towers but not with un-guyed towers. As currently planned, the proposed Project would have 4 permanent un-guyed met towers. Based on the result of the above studies, no avian fatalities are expected that would be associated with the met towers.

Cumulative and Population Level Impacts

In addition to the proposed Desert Claim project, another wind project, the Wild Horse Wind Farm, has been constructed in Kittitas County, and two more, Kittitas Valley Wind Project and Vantage Wind Project, have been permitted. The Wild Horse project has

been monitored for fatalities for one year in 2007 (Erickson et al. 2008). Results of this monitoring study were included in the estimation of potential project impacts above (see Table 3). For cumulative impacts, it is assumed that all four projects are constructed.

Raptors

Based on the updated mortality analysis herein, developed using recent information on wind project impacts, the estimated range of raptor mortality would be from 0 to 29 raptors per year for the Desert Claim Project. Provided all four of the Kittitas County wind projects are eventually constructed, and raptor mortality is similar for each project, the total estimated annual raptor mortality for the County due to wind turbines would range from approximately 0 to 116. In 2007, raptor mortality at the Wild Horse project was estimated at 0.09 per MW. The total raptor mortality for the project was estimated at 20 for the year. Because the Desert Claim, Kittitas Valley, and Vantage projects are smaller in size than the Wild Horse project, the total cumulative annual impact to raptors is not expected to be greater than 80 for all four projects.

In order to determine if this predicted mortality would be considered significant, it was assumed that raptors within the Columbia Plateau physiographic region (ecoregion) would be the populations most likely affected. While local populations of raptors are somewhat difficult to define, birds within the Columbia Plateau ecoregion may easily intermix without any major geographic or topographic barrier, so more local populations (e.g. Kittitas Valley) are not isolated or separated from the larger regional population.

The two species expected to compose a majority of the raptor fatalities based on their relative abundance (observed use of the site; see Young et al. 2003a) and mortality at other regional wind projects are American kestrel and red-tailed hawk. Five of the six raptor fatalities observed at Wild Horse were American kestrel or red-tailed hawks. These two species were among the three most common raptors observed during the baseline studies for all four wind projects in Kittitas County based on use estimates, and they are one of the most common raptors observed during BBS surveys (Sauer et al. 2006) and Christmas bird counts in Kittitas County (National Audubon Society 2006). These two species are also the two most commonly reported raptor fatalities at modern wind projects (see Erickson et al. 2001, 2002) and account for more than 63% of the raptor fatalities recorded at the regional wind projects studied (Table 5).

Table 5

Number and species composition of bird fatalities found at the existing Columbia Plateau Ecoregion wind-energy facilities.

Species	Number of Fatalities	Percent Composition
horned lark	206	31.1
golden-crowned kinglet	43	6.5
ring-necked pheasant	37	5.6
gray partridge	36	5.4
American kestrel	22	3.3
chukar	22	3.3
western meadowlark	21	3.2
unidentified passerine	19	2.9
dark-eyed junco	18	2.7
European starling	17	2.6
white-crowned sparrow	17	2.6
mourning dove	16	2.4
Red-tailed hawk	14	2.1
ruby-crowned kinglet	9	1.4
unidentified bird	9	1.4
yellow-rumped warbler	9	1.4
short-eared owl	7	1.1
winter wren	7	1.1
house wren	6	0.9
unidentified kinglet	6	0.9
black-billed magpie	5	0.8
Brewer's sparrow	5	0.8
golden-crowned sparrow	5	0.8
rock dove	5	0.8
Townsend's warbler	5	0.8
unidentified sparrow	5	0.8
American robin	4	0.6
Canada goose	4	0.6
common nighthawk	4	0.6
ferruginous hawk	4	0.6
northern flicker	4	0.6
rock pigeon	4	0.6
red-breasted nuthatch	3	0.5
song sparrow	3	0.5
Swainson's hawk	3	0.5
white-throated swift	3	0.5
Cassin's vireo	2	0.3
house finch	2	0.3
Macgillivray's warbler	2	0.3
mallard	2	0.3
sage thrasher	2	0.3
savannah sparrow	2	0.3
vesper sparrow	2	0.3
American coot	1	0.2
American goldfinch	1	0.2

Species	Number of Fatalities	Percent Composition
American pipit	1	0.2
barn owl	1	0.2
black-throated sparrow	1	0.2
brown-headed cowbird	1	0.2
bufflehead	1	0.2
chipping sparrow	1	0.2
common raven	1	0.2
Cooper's hawk	1	0.2
downy woodpecker	1	0.2
grasshopper sparrow	1	0.2
gray catbird	1	0.2
great blue heron	1	0.2
great horned owl	1	0.2
hairy woodpecker	1	0.2
house sparrow	1	0.2
killdeer	1	0.2
Lewis's woodpecker	1	0.2
long-eared owl	1	0.2
mountain bluebird	1	0.2
northern harrier	1	0.2
Orange-crowned warbler	1	0.2
red-shafted flicker	1	0.2
red-winged blackbird	1	0.2
rough-legged hawk	1	0.2
sage sparrow	1	0.2
Spotted towhee	1	0.2
Swainson's thrush	1	0.2
Townsend's solitaire	1	0.2
unidentified accipiter	1	0.2
unidentified *Empidonax*	1	0.2
unidentified partridge	1	0.2
unidentified thrush	1	0.2
varied thrush	1	0.2
Vaux's swift	1	0.2
warbling vireo	1	0.2
western grebe	1	0.2
western kingbird	1	0.2
western tanager	1	0.2
Williamson's sapsucker	1	0.2
yellow warbler	1	0.2
Totals (77 species)	**663**	**100.0**

Based on results data from the USGS Breeding Bird Survey (BBS) routes in the Columbia Plateau over the past 20 years, the breeding populations for these two species in the Columbia Plateau is approximately 5,890 kestrels and 7,035 red-tailed hawks breeding individuals in the ecoregion. Cade (1982) estimated North American breeding population of American kestrels at greater than 1.2 million pairs. Estimates of total red-

tailed hawk populations have been reported between 300,000 and 1,000,000 in the U.S. (Preston and Beane 1993).

Given the size of the regional population of the American kestrel and red-tailed hawk, neither the estimated Project impact nor estimated cumulative impact of the four wind projects in Kittitas County will be significant at the Columbia Plateau population level. It is expected that the natural variability of the local population is likely to be much greater than the number of fatalities predicted. There may be occasional fatalities of other raptor species, but they would even fewer than kestrels or red-tailed hawks and not result in significant population effects.

Other Birds

Passerines have been the most abundant avian fatality at wind projects studied (see Erickson et al. 2000, 2001, 2002, Johnson et al. 2002, Young et al. 2003b, 2005, 2007), often representing more than 80% of the avian fatalities. For projects in the Columbia Plateau ecoregion on average approximately 70% of the avian fatalities have been passerines (**Table 4**). Both migrant and resident passerine fatalities have been observed, with migrants generally making up 20-30% of the avian fatalities.

For most studies that have occurred in agricultural settings, a few common species make up the majority of bird observations and fatalities at the site, however, a variety of other species, including migrants, have been recorded as fatalities but typically in low numbers and frequency. The majority of avian deaths (70%) due to wind power facilities in the Columbia Plateau region were of common passerines in mixed agriculture and grassland habitat (see **Table 5**). Horned larks are the most common fatality at most of the projects studied. For example at the Stateline, Combine Hills, Nine Canyon I, horned larks were 39%, 41%, and 47% of all avian fatalities, respectively and a much higher percentage of the passerine fatalities. At Wild Horse, horned lark was also the most common avian fatality (14% or all birds; 20% of passerines) despite the lack of cultivated agriculture at the site which tends to increase horned lark numbers. Other shrub-steppe and open country passerines such as western meadowlarks and European starling were also found regularly. For example, European starling made up 18% of the fatalities at the Hopkins Ridge project (Young et al. 2007).

The expected number of fatalities from Desert Claim alone or in combination with the other wind projects in Kittitas County would not be significant to the regional populations, in general simply because the regional populations are so large. For example, over all passerines recorded during the regional monitoring studies, horned lark made up over half (51%) of the fatalities. Assuming this pattern holds for the projects in Kittitas County, it is expected that on average there would be 190 horned lark fatalities per year for Desert Claim and approximately 635 horned lark fatalities for all four projects. This compares to an estimated regional population of approximately 111,000 horned larks based on the BBS results for the Columbia Plateau ecoregion (Saur et al. 2006). Natural variation in the horned lark population is likely substantially higher than the estimated impacts. Impacts to other bird species are expected to be less based on the results of the other monitoring studies (see **Table 5**) and comprise a much smaller percentage of the pool of fatalities from Columbia Plateau wind projects. These small

impacts would be to individuals and would not result in a significant impact to specific species or general populations.

Bats

Research at other wind projects indicates that the primary impact to bats appears to be risk of collision for fall migratory species with hoary bat (*Lasiurus cinereus*) and silver-haired bats (*Lasionycteris noctivagans*) being the most prevalent Pacific Northwest fatalities (**Table 6**; Johnson 2005). Sparse information exists regarding bat populations in the region; however, non-migratory and resident bat populations do not appear to be negatively impacted by wind turbines (see Johnson 2005). The regional monitoring studies have found very little impact to resident bats with very low numbers of resident bat species (little brown bats, big brown bats) being observed fatalities (**Table 6**).

Table 6
Number and species composition of bat fatalities found at Columbia Plateau regional wind projects.

Species	Number of Fatalities	Percent Composition
Silver-haired bat	163	48.4
Hoary bat	152	45.1
Unidentified bat	8	2.7
Little brown bat	8	2.4
Big brown bat	5	1.5
Totals (4 species)	337	100

Fatality estimates for ten regional wind projects studied have ranged from 0.39 to 2.46 bats per MW per year with an average of 1.18 bats per MW per year (**Table 7**). In these studies more than 90% of the bat fatalities have been hoary and silver-haired bats (**Table 6**). Bat mortality at the Desert Claim Project is not expected to greatly exceed the other regional wind projects studied. It had been speculated that bat mortality could be higher due to the proximity of forests to the north and west, and some projects in other parts of the country have shown that risk to bats may be greater in forested environments (e.g. Kerns and Kerlinger 2004; Nicholson 2003). However, the revised Project area is farther away from forested habitat to the north and west than it was in the 2004 FEIS, and other wind projects in the region are in similar proximity to forests without resulting high bat mortality.

Using a per MW basis, bat mortality at the site may be approximately 0.4 – 2.5 bats per MW per year or between 76 and 475 total bats per year if 190 MW are constructed which is a similar estimate to the previous proposed project. On a cumulative basis for the four wind projects proposed or constructed in Kittitas County, and provided a total of 755

MW are constructed, between 302 and 1888 bat deaths could occur in Kittitas County annually.

Table 7
Mean bat mortality estimates based on fatality studies at regional wind projects.

Project Name [state]	No. Bats /turbine/year	Bats per MW[1]	Reference
Stateline [OR/WA]	0.95	1.44	Erickson et al. 2004, 2007
Vansycle [OR]	0.74	1.12	Erickson et al. 2000
Klondike [OR]	1.16	0.77	Johnson et al. 2003
Klondike II [OR]	0.63	0.41	NWC and WEST, Inc. 2007
Hopkins Ridge [WA]	1.13	0.63	Young et al 2007
Wild Horse [WA]	0.70	0.39	Erickson et al. 2008
Nine Canyon [WA]	3.21	2.46	Erickson et al. 2003b
Leaning Juniper [OR]	1.28	0.86	Kronner et al. 2007
Big Horn I [WA]	2.85	1.90	Kronner et al. 2008
Combine Hills [OR]	1.88	1.88	Young et al. 2005
Average	**1.46**	**1.18**	

[1] Most reports do not provide number per MW of energy produced so this number was calculated based on the mortality per turbine and capacity of turbines studied.

Provided bat mortality at the Desert Claim project is similar to the other Columbia Plateau wind projects, impacts to resident and non-migratory species will be minor and not significant. This low level of mortality impacts for *Myotis* species and big brown bat would be to individuals and not populations, are not considered significant, and would likely be less than natural levels of variation in mortality for these species. This would also hold true for the cumulative impact from all three wind projects.

Unlike with birds, there is little information available about populations of bat species. For most species that are not threatened or endangered and have large geographic distributions, very little is known about potential numbers that exist. Results of monitoring studies across the U.S. and Canada have found similar trends in impacts such as risk to bats from wind turbines is unequal across species and across seasons. The majority of bat fatalities at wind projects in the U.S. and Canada have been tree/forest dwelling long-distance migrant species found in the late summer and fall periods. Species in the *Lasiurus* genus, hoary bat in the west and red bat (*L. borealis*) in the east, and silver-haired bats are the most abundant fatalities found at wind projects. Numerous studies across the U.S. and Canada have shown this trend (see Johnson 2005). The highest mortality occurs during what is believed to be the post-breeding dispersal and fall migration period for bats from roughly late-July through September. Numerous studies across the U.S. and Canada have also shown this trend (see Johnson 2005). Much lower mortality rates, and particular in the Columbia Plateau ecoregion, occur in the spring and summer.

Hoary bats and silver-haired bats generally occupy forested or treed habitats during the breeding season, habitat distinctly lacking and localized throughout the Columbia Plateau ecoregion, but adjacent to the wind projects proposed in Kittitas County. Monitoring of the nearby Wild Horse wind project did not suggest that the nearby forest influenced bat mortality. The impacts to bats at Wild Horse were similar to the other Columbia Plateau wind projects and were on the low end of the range of bat mortality (see **Table 7**).

The significance of the impact on hoary and silver-haired bat populations is difficult to determine, as there is very little information available regarding the overall population size and distribution of the bats potentially affected. Hoary bat and silver-haired bats are two of the most widely distributed bat species in North America (Shump and Shump 1982; Kunz 1982) and it is likely that, due to the size of the species ranges, that they have fairly large population sizes. Unlike many bird species that may have multiple clutches of multiple young per year, hoary bats and silver-haired bats typically raise only one or two young per year and only breed once per year (Shump and Shump 1982; Kunz 1982). Bats tend to live longer than birds; however, and may have a longer breeding lifespan. The impact of the loss of breeding individuals to populations such as these may have greater consequences, and the long-term consequences of mortality on long-lived, low-fecundity species such as bats are generally unknown.

If bat mortality at Desert Claim is similar to the Wild Horse wind project, it is not expected to be significant. Total bat mortality at Wild Horse was estimated at 89 individuals for 2007 (Erickson et al. 2008). Provided the Desert Claim, Kittitas Valley, and Vantage projects have similar or less impacts than Wild Horse, due to their smaller sizes, there would be less than 356 total bat fatalities per year in Kittitas County due to wind turbines. Due to the migratory status of hoary and silver-haired bats, this mortality impact would be primarily on populations from surrounding mountainous/forested ecoregions and from more northern regions (e.g., Canada) during the fall migration. Given that this impact would be primarily on wide ranging migratory species, the populations potentially affected are likely to be very large. Under the assumption that hoary and silver-haired bat populations are large and stable, this level of mortality is not likely to be greater than background mortality for these species. However, this assessment must be qualified by the lack of information on the species population sizes, status, and dynamics.

Other Wildlife

Small Mammals

Impacts to ground-dwelling mammals occurring on site would include fatalities from construction activities, loss of habitat, and disturbance or displacement. The incremental change in these types of impacts from the new proposal over the previous proposal is difficult to estimate; however, it is expected that the overall impacts would be less due to the smaller project size. Small mammals are expected to repopulate impact areas after construction activities cease and reclamation is complete, and they may re-colonize areas quicker due to the smaller project. Some small mammal fatalities can be expected from

O&M vehicle traffic, but because the Project would be smaller overall, these impacts would be less.

A comment submitted during scoping for the original EIS expressed concern that the project might result in declines in the raptor population that would lead to an increase in the population of rodents that are prey species for raptors. Because certain rodents such as deer mice are carriers of hantavirus, which is an airborne pathogen that can be contracted by humans, the concern was that this indirect impact on rodents could result in increased risk of human exposure to hantavirus. Overall, the total rodent population in the area is likely a function of environmental conditions and not controlled by predators. The small impacts to raptors anticipated from the project would not have a noticeable or measurable affect the rodent population.

Reptiles and Amphibians

Aquatic or moist habitats for amphibians and reptiles are generally restricted to the riparian, wetland, and pond areas within the study area. Substantial impacts to these areas are not anticipated due to regulatory requirements to minimize impacts, and erosion and sedimentation prevention methods will be used in adjacent upland construction areas. Due to the overall reduction in the project size, impacts to these habitats will decrease and thus the potential for impacts to aquatic wildlife will decrease.

As with ground-dwelling mammals, snakes and lizards that occupy upland areas may experience fatalities due to construction activity. Due to the overall reduction in project size, the potential for and magnitude of this impact will be less than the previous proposal. Some reptile fatalities can be expected from O&M vehicle traffic, but again, because the project would be smaller overall with fewer roads, these impacts would be less.

Big Game

The new Project area is within the Ellensburg mule deer winter range and two high-density deer wintering areas occur within 1.5 miles of the project. Also, the Quilomene elk migration corridor is an important spring pathway that is north of the project. Project construction and operation could result in disturbance or displacement impacts to big game, including deer wintering in the area, which, during very severe winters, could result in mortality impacts due to animals being forced into marginal habitat that does not sustain them over winter. Overall these types of impacts from the new proposal are expected to be less because of the smaller project area. There will be less overall road and turbine strings that could fragment habitat or create barriers to movement. Also the new Project area is concentrated more around existing infrastructure (e.g., transmission lines, local roads) than the previous proposal, which reduces the amount of additional habitat fragmentation that would occur from the project. The smaller Project should result in less displacement or less potential for displacement to adjoining cropland, reducing the possibility that crop damage claims in the project vicinity may change.

The northernmost section of the Project area is near the southern edge of the Quilomene elk migration corridor. It is unknown to what extent this area is used by elk, or if the new Project is within view of the migration corridor. If this area of the Project influences spring elk movement, it is expected that elk will shift their path to the north without migratory hindrance due to the large size of the corridor. There is no change in this potential impact from the previous proposal, as the same northern project section was included in both project layouts.

Temporary loss of habitat from Project construction is a relatively minor impact due to expected vegetation reclamation and the large expanse of suitable habitat for mule deer in the region. Once construction is complete, it is expected that deer would become habituated to wind turbines and occupy areas within the wind plant. There will also be intermittent disturbances from vehicle and human traffic during regular O&M activities, and also from turbine noise and shadow flicker of moving blades. If deer tolerance thresholds are exceeded by these disturbances, it is expected that mule deer will seek remote areas of nearby ravines or forests. Should the facility eventually result in a sanctuary for big game due to reduced hunting pressure, seasonal use of the wind plant by big game may increase. However, the new proposal is smaller and would not create as large of a sanctuary area.

Threatened and Endangered Species

The previous environmental impact analysis determined that the original project would have no effect on the majority of the State or Federally listed threatened or endangered species potentially occurring in or near the Project area. One federally threatened species, steelhead, could occur in the Project area and therefore may be at risk of adverse impacts from the Project. At the time of the original Environmental Impact Statement, bald eagle was a federally threatened species and Washington State sensitive species. Bald eagle was removed from the list of threatened species in 2007 but remains a state sensitive species.

Bald eagles occur in the Project area during the winter from approximately late December to early April. There is no evidence that bald eagles breed in the Project area or nearby although the Yakima River riparian corridor provides suitable breeding habitat. Potential impacts to bald eagles identified in the previous analysis included disturbance or displacement during the winter season, potential loss of roosting and foraging habitat, and potential mortality due to turbine collisions. The new proposal which is smaller in size and with fewer turbines generally will have less potential impact to bald eagles than the original proposal. The Project will not affect the Yakima River riparian corridor or bald eagle roost sites and habitat along the Yakima River. Temporary loss of potential isolated roosting habitat (scattered patches of trees) due to construction disturbance would be for the short duration of the construction period (9-12 months), most of which will be outside the winter season and would affect even less of the available roosting habitat than the original proposal. During avian studies at the site, bald eagles were observed using the Wilson Creek riparian corridor and Wilson Creek Canyon to the northeast of the original project area. While no roosts were found in this area, the current

proposal is greater than 3 miles from this area, further reducing the possibility of disturbance impacts at roost sites. Wintering bald eagles forage throughout the surrounding area on carrion, livestock by-products, and fish in the Yakima River. To the extent that carrion or livestock by-products occur on site, bald eagles may forage on the site. Cattle operations in the Project area are considered independent of the wind project and the Project is not expected to reduce foraging opportunities for bald eagles. Bald eagles flying within the Project area would have some exposure to turbine-caused mortality; however, there have been no documented bald eagle fatalities at wind plants and the number of turbines proposed is less resulting in less over all collision risk. The Project also occupies a smaller overall area resulting in less potential to disrupt normal movement patterns of wintering eagles in the valley. Any mortality that might occur over the Project life would be at a very low level and would not have a measurable effect on the bald eagle population. Operation of the Project should have minimal disturbance effect on bald eagles, based primarily on their relatively low use of the Project area (see Young et al. 2003a) and the fact that the bald eagle occupation period overlaps the least windy time of year.

For steelhead trout, the WDFW provided information indicating that due to diversion of water from First Creek into Green Canyon and eventually to the Reecer Creek sub-basin, steelhead could possibly occur in Reecer Creek which flows through the Project area. Also, the Columbia River district population segment of bull trout is listed as a threatened species under the Endangered Species Act and potentially occurs downstream in the Yakima River. Due to steelhead occurring within the Project area, and the potential for downstream impacts (see the Desert Claim FEIS) the Project has the potential to adversely affect these species. The Reecer Creek drainage where steelhead potentially occur is within the new proposal Project area. Potential impacts to steelhead from the new proposal are not expected to change over the original proposal. In essence, the portion of the original proposal that could potentially affect steelhead was the western sections around Reecer Creek. These sections are still included in the new proposed Project so potential impacts to steelhead remain.

State listed wildlife that may occur in the Project area include golden eagle, northern goshawk, sage thrasher, and loggerhead shrike. The initial environmental impact analysis determined that potential impacts to these species would be minimal and include the basic impacts discussed for birds (mortality, disturbance/displacement, and possible loss of habitat). The current proposal, which has fewer turbines and occupies a smaller area, may further reduce the potential for these impacts. For example, loggerhead shrike and sage thrasher are possible breeding residents in the study area and would occupy shrub-steppe vegetation. The new proposal reduces impact to shrub-steppe by approximately 26 acres thus reducing the potential for impacts to these species.

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GEC
a DNV company

Sound Mapping for Desert Claim Project

CSRP0011-A

CONFIDENTIAL

December 19, 2008

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Overview

enXco, Inc. contracted with DNV Global Energy Concepts Inc. (DNV-GEC) to perform sound mapping for the proposed Desert Claim wind power project located approximately 8 miles north of Ellensburg, Washington. This report summarizes findings for the project area and for individual residences in the project vicinity and reflects the current turbine layout and project boundary.

The findings indicate that the wind turbines will produce sound levels of no more than 50 decibels on the A-weighted decibel (dBA) scale at the project boundaries with three exceptions. At one location along the North Branch Canal in the southeast of the project area, the expected sound level at the southern edge of the canal reaches 52 dBA, but the expected sound levels will be 50 dBA or less at the non-participating properties south of the canal. The 50 dBA sound level is also exceeded at the southern boundary in the southwestern area of the project on the property of a project participant, and extends south across the canal where it will be 50 dBA or less at the non-participating properties south of the canal, The third location is on the property of a project participant along the western border, southwest of the project. The study also evaluated expected changes in sound level at nearby residences, and concluded that at the residences the change to the background sound levels would be minimal.

Sound Impacts

Sound moves through air as waves of pressure fluctuations caused by vibrations. As sound moves away from its source, the sound pressure decreases because the sound is spread over an increasing area and attenuated (dissipated) by obstructions, obstacles, and the atmosphere. The most common unit of measure used to describe the magnitude of sound levels is the decibel (dB). Sound levels are often stated in terms of decibels on the dBA scale, which is weighted to reflect the response of the human ear by attenuating, or discounting, some of the noise in the low- and high-frequency ranges to which the human ear is less responsive. Sound pressure levels differ from sound power levels. Sound power levels are characteristic of a sound source. Sound pressure levels are what is perceived by the human ear and vary with distance from the source. Wind turbines are often rated at a particular sound power level which is calculated from measurements performed according to a standard (such as International Electrotechnical Commission Standard IEC 61400-11). This sound power rating is a property of the equipment and is not dependent on distance from the source or environmental factors.

The dBA scale is logarithmic, so individual dBA ratings for different sources cannot be added directly to calculate the sound level for combined sources. For example, two sources, each producing 50 dBA will, when added together logarithmically, produce a combined sound level of 53 dBA. In typical situations, a 3 dBA change in sound levels is considered a just-perceivable difference, while a 10 dBA change is considered an approximate doubling of perceived loudness. Typical sound levels include about 110 dBA for construction noise, 90 dBA for a heavy truck accelerating, 60 dBA for a conversation, and 50 dBA for a quiet office. (Additional background information on sound measurements can be found at www.jimprice.com/prosound/db.htm).

When operating, wind turbines produce a "swishing" or "whooshing" sound as their rotating blades encounter turbulence in the passing air, as well as some sounds from the mechanical parts

such as the gearbox, generator, and cooling fans. At a distance of several hundred meters (approximately 600 to 900 ft), the sounds generated by a wind turbine are frequently masked by the "background noise" of winds blowing through trees or moving around obstacles. Wind turbines are typically quiet enough for people to hold a normal conversation while standing at the base of the tower. If mechanical sounds are significant, it usually means something in the nacelle needs maintenance or repair.

Project Area Impacts

A sound contour map was generated using WindFarm software assuming the REpower MM92 turbine specifications and using the IEC 61400-11 acoustic reference wind speed of 8.0 meters per second (m/s) (18 miles per hour [mph]) wind speed measured at a reference height of 10 m (33 ft) above ground level.

Figure 1 represents a sound contour map of the project area, calculated at the reference conditions. The sound power rating used to produce the reference condition map is 105.0 dBA as described in *Sound Power Level of REpower MM92.*[1] This rating would produce a sound pressure level of about 50 dBA at about 185 m (600 ft) away from the base of an isolated turbine under the acoustic reference condition (8.0 m/s measured at 10 m above ground level[2]).

Sound Power Level of REpower MM92 also indicates that the maximum sound power rating of 105 dBA is not exceeded at wind speeds above the 8.0 m/s reference wind speed. At higher wind speeds, sounds from the wind turbine become less noticeable because background noise associated with the wind itself increases and tends to mask that being generated by the turbine.

In the model, the generated sound is represented as a point source at the wind turbine's hub, which is consistent with how the turbine sound power level ratings are typically defined. This approximates the sound pressure waves produced by the blades over their entire path of travel. Sound will decrease over distance due to other factors such as atmospheric damping, terrain absorption, and interference of obstacles; however, the primary mechanism for the decrease of sound is distance attenuation. In this model, there is no assumed change of sound due to vegetation, obstacles, or sound being propagated by the wind. Background noise is not taken into account in the model. The model assumes an attenuation coefficient of 0.005 dBA/m. This is equivalent to typical sound attenuation with distance due to the divergence of sound energy (about 6-8 dBA per doubling of distance) up to a distance of 400 m (1300 ft) from a turbine.

The sound level at the project boundary was investigated. For the acoustic reference wind condition producing the maximum hub-height sound power level of 105.0 dBA, the maximum calculated sound pressure level along the project boundary is 50 dBA in all locations where neighboring property is land, except at three locations:

- At one location along the North Branch Canal in the southeast of the project area, the expected sound level at the southern edge of the canal reaches 52 dBA, but the expected sound levels will be 50 dBA or less at the non-participating properties south of the canal. The 50 dBA sound level is also exceeded at the southern boundary, southwest of the

[1] *Sound Power Level of REpower MM92*, Document: SD-2.9-WT.SL-1-A-EN, March 5, 2005.
[2] For this reference, a site average vertical shear coefficient of 0.1429 is assumed.

project area, on the property of a project participant, and extends south across the canal where it will be 50 dBA or less at the non-participating properties south of the canal. The maximum sound level at this location along the southern project boundary will reach 64 dBA.

- The third sound level exceedance occurs on the property of a project participant along the western border, southwest of the project. The sound level will reach a maximum calculated sound pressure level of approximately 52 dBA in portion of the adjacent property which is owned by a project participant. The 50 dBA sound contour extends approximately 47 m (154 ft) into the adjacent property west of project area.

Under site wind conditions of less than 8.0 m/s, the sound pressure level would be lower at all locations along the project boundary.

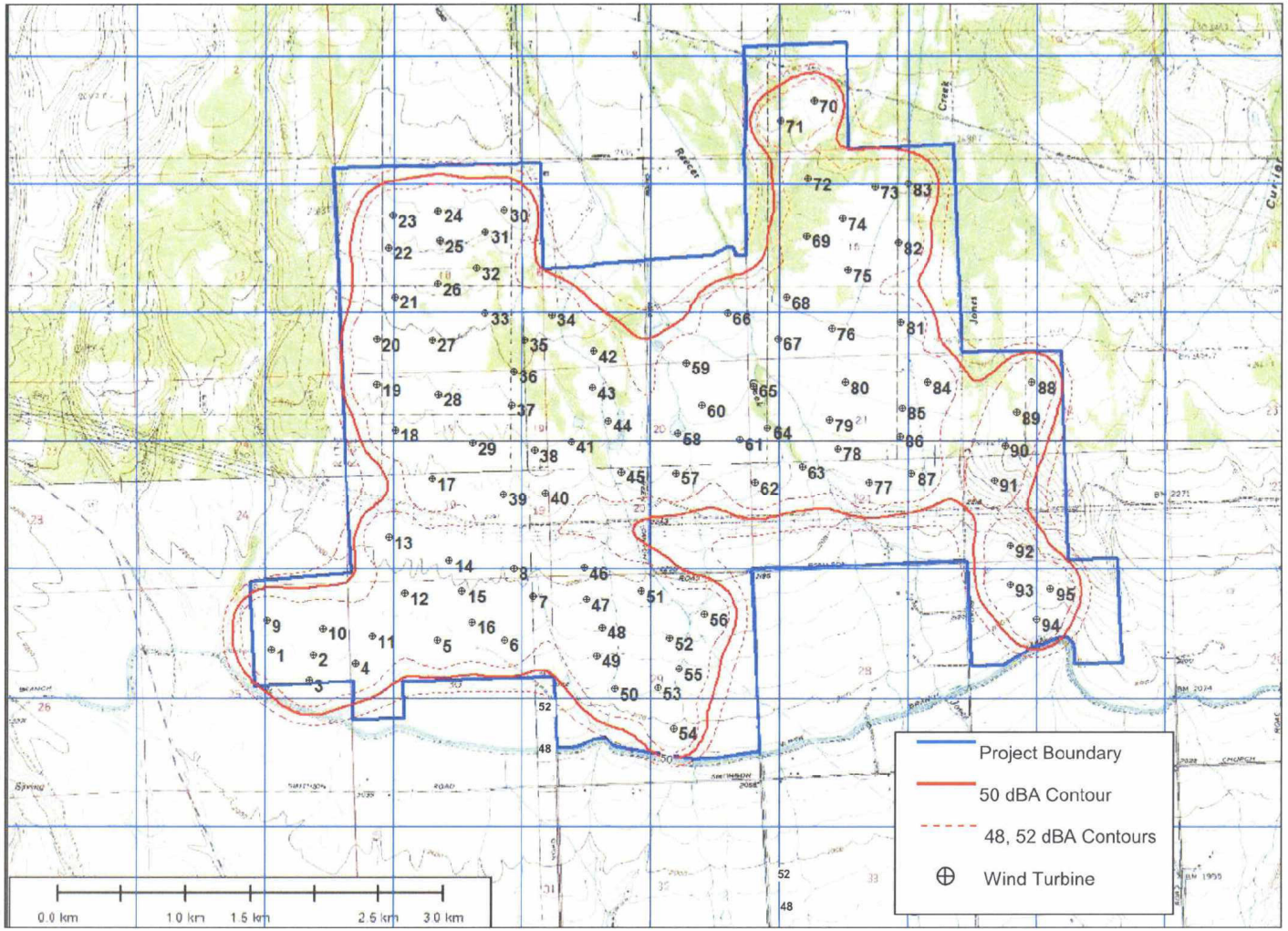

Figure 1. Sound Contour Map for Desert Claim Project Area at Reference Conditions: 8 m/s Wind Speed at 10-m Height

Impacts on Identified Receptors

In addition to modeling the expected sound levels from the turbines, DNV-GEC analyzed the incremental change in sound levels that is expected to be perceived by observers at nearby residences. Sound impacts for residences in the project area were modeled using WindFarm software assuming the REpower MM92 turbine specifications and the IEC 61400-11 acoustic reference wind speed of 8.0 m/s (18 mph) measured at a height of 10 m (33 ft). Figure 2 shows the identified receptor locations provided by enXco for nearby residences. The sound impact results for turbines on each receptor were then combined with background noise levels to provide an estimate of the total sound level at each residence. As actual background sound levels are not known, sound impacts are summarized for a range of different assumed background noise levels, 40 dBA, 50 dBA, and 60 dBA. The resulting impacts are shown in Table 1.

As shown in Table 1, when background sound levels are 60 dBA, the project is not expected to result in a sound level increase at any of the 37 residences considered. When background sound levels are 50 dBA, the project is expected to result in a 0-2 dBA increase in sound level at the residences, but such a small increase is not generally perceivable. When background sound levels are 40 dBA, the project is expected to result in a perceivable increase in sound levels at the residences (1-9 dBA), but the combined sound level is expected to be below 50 dBA at all of the residences.

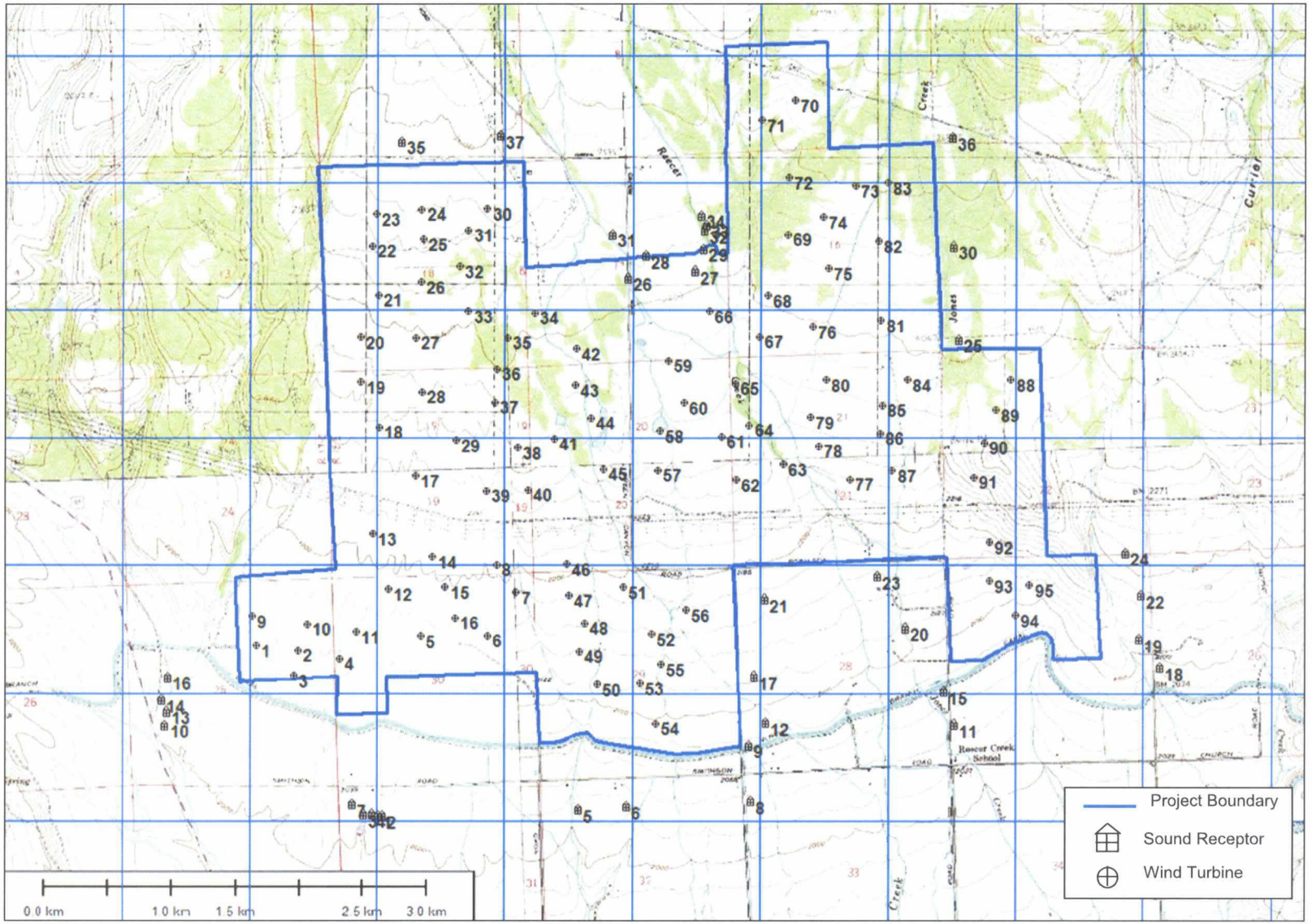

Figure 2. Identified Residential Sound Receptors

Table 1. Sound Impacts for Varying Background Noise Levels

Residence ID	Turbine Sound Impact (dBA)	Resulting Sound when Combined with Indicated Background Sound Level		
		40 dBA	50 dBA	60 dBA
1	38	42	50	60
2	38	42	50	60
3	38	42	50	60
4	38	42	50	60
5	40	43	50	60
6	41	44	51	60
7	39	42	50	60
8	38	42	50	60
9	41	44	51	60
10	39	42	50	60
11	37	42	50	60
12	41	44	51	60
13	39	43	50	60
14	40	43	50	60
15	40	43	50	60
16	41	44	51	60
17	44	45	51	60
18	35	41	50	60
19	38	42	50	60
20	42	44	51	60
21	44	46	51	60
22	39	42	50	60
23	44	45	51	60
24	40	43	50	60
25	48	48	52	60
26	46	47	52	60
27	49	49	52	60
28	45	46	51	60
29	47	48	52	60
30	45	46	51	60
31	44	45	51	60
32	46	47	51	60
33	46	47	51	60
34	45	46	51	60
35	45	46	51	60
36	42	44	51	60
37	44	45	51	60

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Analysis and Commentary:

Hazard Zones Resulting From Certain Defined Failures Of REpower MM92 Wind Turbines at the Desert Claim Project

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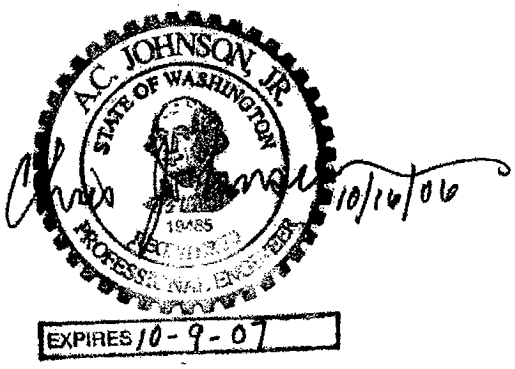

Background

KPFF has been requested by enXco to provide analysis and commentary on possible hazards resulting from certain failures of the specified REpower MM92 wind turbine assembly. The primary author of this report has completed a similar analysis of a similar turbine assembly for Kittitas County, Washington, in preparation of the Environmental Impact Statement (EIS) for the Desert Claim Wind Power Project. This report draws from the literature search and calculations previously completed for those reports.

Three types of failures were identified for consideration in this report:

1. Blade Throw: Loss of an entire blade by failure at the hub attachment.
2. Tower Failure: Complete failure of the tower, particularly at the base.
3. Ice Throw: Ice accretions being thrown from a moving rotor.

It is prudent to consider the potential hazard zones created by various failure modes and take appropriate measures to mitigate risks. One of the most commonly employed means of managing these risks is the imposition of setbacks. It must therefore be noted that the calculations herein of potentially affected areas are idealized and simplified. Extensive modeling of risks associated with various failures has not been accomplished by the industry, and, because the risks are rare, it is not possible to corroborate the calculations with experiential data. The use of safety factors over and above calculated distances is recommended practice when determining setbacks.

Basics

The following data regarding wind turbine structural, machinery, operating and siting characteristics were provided by enXco and from the REpower MM 92 technical specification for this study.

Given:

- REpower MM92 wind turbine
- Location – Kittitas County, WA
- Rotor diameter – 92.5 meters (303 feet)
- Tower height – 80 meters (262.5 feet)
- Cutout wind speed – 24 m/s (54 miles per hour)
- Rotation speed – Maximum of 17 rpm (revolutions per minute)
- Tower base at same elevation as surrounding area.

It must be noted that (1) blade throw distances are mainly in the plain of rotation, not down wind and (2) the prevailing wind direction does not uniquely define wind direction at time of failure. Therefore **the potential hazard zone created by any failure should be considered as a circle with the tower at the center**. In other words, it is not safe or good practice to determine setbacks based on prevailing wind direction, unless the turbines are physically limited to that orientation.

kpff Consulting Engineers

Blade Throw

If a blade detaches from the rotor, its trajectory will be dependent upon the loading and stress state at the time of failure, and on the type and progression of failure before separation. This having been said, it is still useful to perform a simplified calculation of possible throw distance for use as a reference when considering setbacks. The simplified worst-case loss of a whole blade would occur with the blade rotating at maximum speed, when the blade is oriented at 45° from the vertical and rising. This is the classic maximum trajectory case from standard physics texts and yields the results in the table below as illustrated in **Figure A**. Review of these data indicates that for the REpower MM92 defined above, the maximum calculated blade throw distance is 152.3 m (500 ft.) from the tower to tip of the fallen blade.

The simplifications in this calculation can be summarized as follows. First, lacking detailed design data for the rotor blade, the blade center of gravity has been conservatively located as if the blade were of uniform thickness. In reality the blade CG is much closer to the hub so the actual initial kinetic energy would be much lower than estimated – perhaps by as much as 40%-50% - and the thrown distance will be proportionately reduced. Secondly, it is assumed that the blade travels and lands oriented parallel to its flight path (i.e., like a javelin) in plane with its original plane of rotation. Thirdly, drag forces along and perpendicular to the flight path are assumed to be extremely small compared to the weight (several tons) of each blade.

Blade Throw Distances

Turbine Model	Rotor Diameter	Rotor Speed	Tower Height	Blade Throw
REpower MM92	92.5 m (303 ft.)	17 RPM (max.)	80 m (262.5 ft.)	500 ft.

As mentioned previously, setbacks should be larger than the calculated maximum distance to account for the simplifications and uncertainties inherent in the calculations. KPFF conservatively recommends using a multiplier of 1.25, to establish a safety setback of 625 ft.

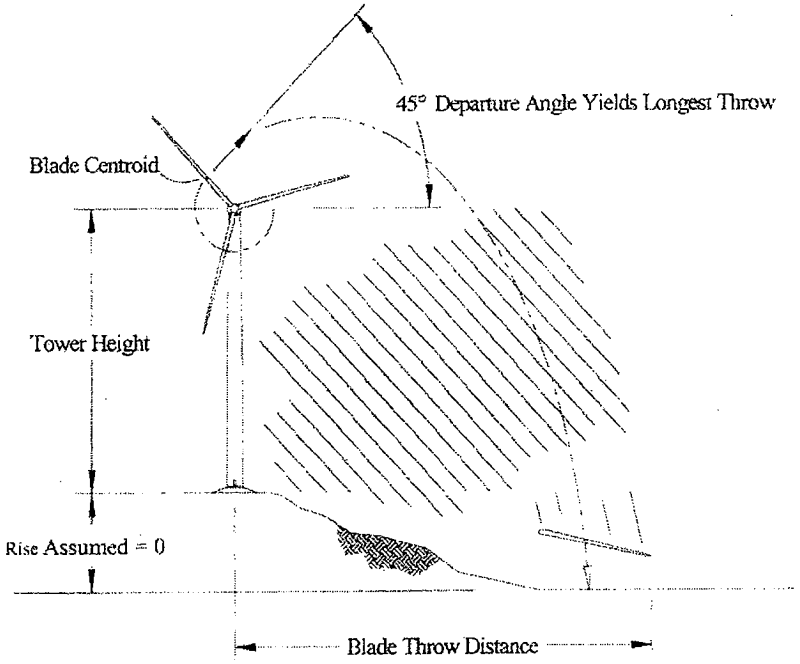

Figure A
Blade Throw Hazard Zone

Tower Collapse

Collapse of a turbine tower that has been constructed in accordance with international standards and local building codes is an extremely remote possibility. The Washington State Energy Facility Site Evaluation Council (2003) documented a personal communication with an insurance industry executive whose company insures over 12,000 wind turbines worldwide, indicating that he was not aware of any case of a tubular wind tower collapsing. In the unlikely event of a tower collapse, persons, animals and facilities within the area could be at risk of being struck by the tower, the nacelle or the turbine rotor blades. Each of these items weighs many tons, so it is reasonable to expect that being struck would result in damage, injury or death.

Failure of the tower at its base, or of its anchorage to the foundation, would create a hemispherical hazard zone with a radius approximately equal to the tower height (to the rotor centerline) plus one half of the rotor diameter. Persons, animals, and facilities within this radius would be at risk of being struck by the tower, generator assembly or rotor blades. For the specified REpower MM92 turbine and tower, the radius of the hazard zone under this scenario would be 126.3 meters (414 feet); this relates to a circular area at ground level of about 12.4 acres. Note that the area of potential impact due to tower collapse is smaller than that calculated for blade throw above.

Theoretically, it is also possible for tubular steel towers to buckle at some point along their length. Under this scenario the potential area of impact would be smaller than that of a tower failing at its base.

Ice Throw

Under certain conditions ice can form on wind turbine towers and rotor blades in a variety of ways. It has been observed that moving rotor blades are subject to heavier buildups of ice than stationary structures through the mechanism of rime icing (Morgan et al., 1998). Rime icing occurs when a sub-freezing structure is exposed to moisture-laden air with significant velocity. If the ice then becomes detached while the blades are rotating, there is the possibility of "ice throw" over a considerable distance from the turbine. Persons, animals and facilities within the ice throw hazard zone could theoretically be at risk of being struck by falling ice fragments.

Ice throw over 100 m (328 ft) has not been documented as a hazard and an ice throw injury report has not been found in the course of this or previous studies. One manufacturer recommends an ice throw exclusion zone with a radius of 125 m (410 ft) on the downwind side of the tower, which they cite as 125% of the largest recorded throw distance.

Summary of Findings

KPFF has conducted calculations that indicate a safety setback of 625 feet from each turbine tower will provide protection of people and facilities from the possibility of blade throw, tower failure and ice throw. Beyond this safety setback, no impacts from these hazards are expected.

GEC
a DNV company

Shadow Mapping for Desert Claim Project

CSRP0012-A

CONFIDENTIAL

December 19, 2008

Prepared for:

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MANAGING RISK DNV

Approvals

Prepared by Julia Meier — December 19, 2008 (Date)

Reviewed by Sarah J. Meyer — December 19, 2008 (Date)

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Introduction

enXco, Inc. contracted with DNV Global Energy Concepts Inc. (DNV-GEC) to perform shadow mapping for the proposed Desert Claim wind power project located approximately 8 miles north of Ellensburg, Washington. This report summarizes the shadow impact findings for the project area and for individual residences in the project vicinity, and reflects the current 95-turbine layout and project boundary .

Shadow Impacts

The shadows cast by the wind turbines will vary with several factors including turbine size, season, time of day, surrounding terrain, cloud cover, wind speed, and wind direction. The height of the sun in the sky varies by season, as does the time and location at which it rises and sets. In the winter, the sun rises late in the southeast, travels in a low arc across the southern sky, and sets early in the southwest. Because it is so low in the sky, it casts longer shadows. In the summer, the sun arcs through the sky at its highest angle and casts the shortest midday shadows. However, in the summer, the sun also rises earliest, sets latest, and covers a wider range of directions, from the northeast around the south to the northwest. Therefore, the summer sun casts shadows that span a broader direction range than in other seasons, and its early sunrise and late sunset create shadows earlier in the morning and later in the evening than in other seasons.

Shadows become less sharp (more diffuse) as the distance between the shadow-casting object and the observer grows. When considering shadows cast by relatively small objects at a long distance from the observer, at a sufficient distance no noticeable shadow forms at all because the object does not significantly block the sun's light. Instead, light diffracts (or bends) around the edges of the object, and the object itself becomes relatively small compared to the apparent size of the sun. The object becomes something that is silhouetted in front of the sun rather than something casting a shadow.

The part of the shadow where the light source is fully blocked is called the umbra; the part where the light source is only partially blocked is called the penumbra. On a sunny day, this phenomenon can be observed with the shadow of a flag pole. At its base the shadow has sharp edges because it is an umbra and has no penumbra. The shadow of the upper part of the pole has fewer and fewer sharp edges with more and more penumbra and less umbra.[1] At a sufficient distance, there is no umbra, and the pole becomes an object visible in the foreground of the sun.

Shadow flicker caused by wind turbines is defined as alternating changes in light intensity due to the moving blade shadows cast on the ground and objects, including windows at residences. The influence of shadow flicker on residences depends on the length and direction of shadows cast by wind turbines and the relative location of wind turbines and windows at the residence.

The sun is approximately 150 million km away from the earth, and the sun has a diameter of approximately 1.4 million km. Therefore, the diameter of the sun covers an arc 0.5° wide when viewed from earth. The maximum width of a wind turbine blade is approximately 4 m. (This is near the hub at the "maximum chord" position; the blade profile tapers to much less than 2 m as

[1] Source: University of Queensland, Australia. (http://www.uq.edu.au/_School_Science_Lessons/UNPh28.html).

distance from the hub increases, and because the blade is relatively thin, from most viewpoints the blade is effectively well below 2 m wide.) Assume a 2-m wide blade section cuts across the disk of the sun, and further assume the blade must obscure more than half of the sun to make a clear shadow that could contribute to flicker. Given these assumptions, a blade covering more than 0.25° (half the width of the sun) can potentially cause flicker. Therefore, the outer edge of influence from this shadow can be considered as the distance at which a 2-m wide object represents 0.25°, which is approximately 458 m or about 1500 ft. In the case where smaller parts of the blade cast the shadow (such as farther "out" on the blade), the distance at which shadows become insignificant is much closer to the wind turbine. This is important to consider because the parts of the blade that reach near the overall height of the wind turbine are much slimmer than the portions of the blade located near the hub of the wind turbine, and it is the overall height that is used in the shadow analyses.

The prevailing wind direction for the project site is from the northwest. The lateral extent of the blade shadow depends on wind direction, as the wind turbines yaw to face into the wind during operation. For example, during northwesterly winds, the turbine rotor will face to the northwest, and a relatively small shadow would be cast on a receptor if the sun is in line with the plane of the rotor. This would occur early in the morning in the summer (sun from the northeast) and late in the afternoon in the winter (sun from the southwest). In these cases, the rotor shadow will be in the shape of a narrow ellipse. On other occasions, the sun will be perpendicular to the rotor plane, and cast a larger area of moving blade shadows on the ground. In these cases, the ellipse will be wider. Generally, a southern or northern wind will have minimum shadow impact because the widest shadows would be cast at midday. At midday, shadows are also the shortest (closest to the wind turbine) due to the sun's position high in the sky.

Shadow flicker impacts were calculated for the Desert Claim project area using WindPRO software. This model generates site-specific results, taking site location (latitude/longitude), elevation, and monthly average cloud cover into account. The model also takes wind direction into account by modeling the average amount of time per year the turbine is yawed in various directions. Obstruction objects such as trees or buildings are not accounted for in the model. As the sun approaches the horizon, it is less intense and therefore the shadow influence is reduced. The model did not calculate shadow influence when the sun is at or below an angle of 4° above the horizon. This 4° assumption corresponds to approximately 30 minutes after sunrise and 30 minutes before sunset.

The assumptions applied in the WindPRO model are generally conservative, and err on the side of over-predicting shadow impacts. Cloud cover tends to be greater in the mornings and evenings than it is midday. Similarly, shadows are longer (although more diffuse) when the sun is lower in the sky. Since cloud cover data were available as monthly averages rather than by time of day, the model results will be conservative. The model assumes that the turbines are always operating. In reality, no flickering effect occurs in calm or very low winds, when the rotor is stationary or turning too slowly to cause flicker. Obstructing objects such as trees, silos, or buildings may block shadow impacts on some receptors; these factors are not reflected in the model results.

To address shadow flicker generally, theoretical houses have been assumed to be located at eight compass points around a representative turbine, as illustrated in Figure 1. A model was built with

houses at distances of 750 ft (230 m), 1000 ft (305 m), and 1500 ft (458 m) from the turbine. Each house is assumed to have a generic 1 m by 1 m square window located 1 m above ground level and facing the turbine. It is likely that many houses will have windows that are not perpendicular to turbines, which will decrease the shadow impact on these houses. The model was run with an 80-m hub height and an approximately 92-m rotor diameter, which is representative of the REpower MM92. The results assume the turbine is yawed to various directions according to the annual direction distribution of the wind regime at the Desert Claim site. The results also take elevation differences, but not other structures or vegetation into account.

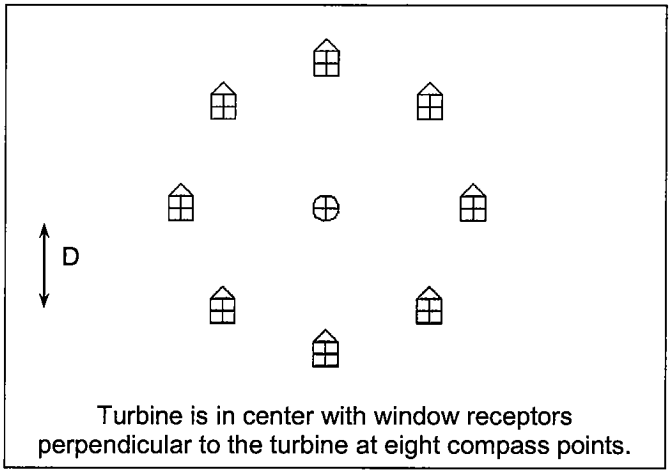


Figure 1. Sample Layout for Shadow Flicker (D = 750, 1000, and 1500 ft)

A review of Washington cloud cover data from the National Climatic Data Center yielded long-term data from Stampede Pass and Yakima. Stampede Pass is approximately 40 miles west of the project site, in the Cascade Mountains. Stampede Pass data are likely to be influenced by mountain weather that is not representative of the project site. Yakima is 28 miles south of Ellensburg, and approximately 36 miles south of the project site (see Figure 2). The cloud cover in Yakima is expected to be slightly less than the cloud cover in Ellensburg; however, it is the most representative site available. These data include mean monthly cloud cover data averaged over a 50-year period. Monthly data are presented as mean days per month characterized as "Clear," "Partly Cloudy," and "Cloudy" between sunrise and sunset. "Clear" is defined as 0-2 eighths of the sky being obstructed by cloud cover, "Partly Cloudy" specifies clouds in 3-6 eighths of the sky, and "Cloudy" represents 7-8 eighths of the sky being cloud covered. From these data, monthly sunshine probabilities were derived (as 100% minus percent cloud cover) and applied in the model (see Table 1).

Table 1. Cloud Cover Data for Yakima, Washington

	Sunrise to Sunset, Mean Cloud Cover (Eighths of Sky Covered)	% Sunshine During Daylight Hours
January	6.3	21%
February	5.9	26%
March	5.4	33%
April	5.2	35%
May	4.7	41%
June	4.2	48%
July	2.5	69%
August	2.7	66%
September	3.1	61%
October	4.5	44%
November	5.8	28%
December	6.2	23%
Average	**4.7**	**41%**

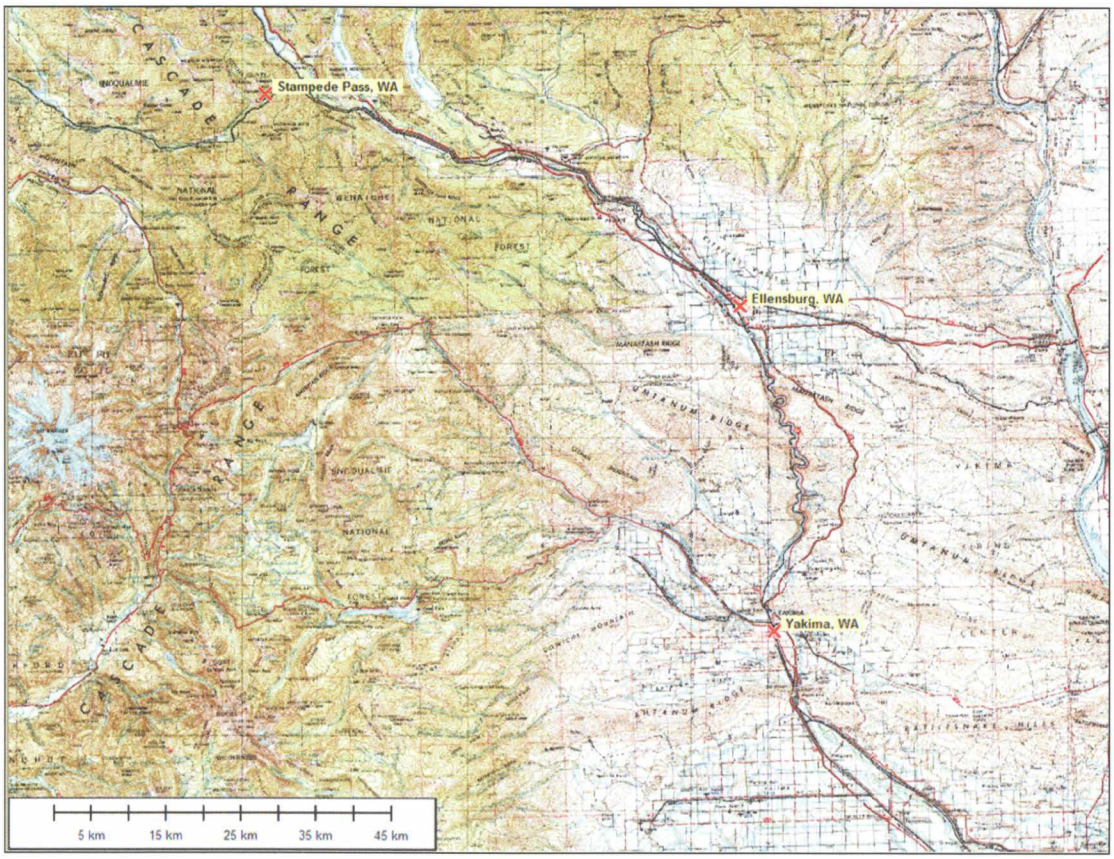


Figure 2. Cloud Cover Data Locations Relative to Ellensburg

For those receptors that have potential shadow flicker impacts, Exhibit A graphically indicates the days of the year and hours of the day in which shadow flicker impacts could occur. The shaded area on each plot illustrates the time of shadow impact. Generally, the results show that houses to the south of a turbine do not have impacts, and that houses farther away from a turbine would have fewer hours of impact. Also, with the exception of short midday impacts in the winter due to low sun angles, the results show that houses 1000 ft away have impacts limited to mornings and evenings, when the sun angle is low and shadows tend to be more diffuse.

Table 2, Table 3, and Table 4 provide a summary of shadow flicker impacts for houses 750 ft (230 m), 1000 ft (305 m), and 1500 ft (458 m) from a turbine, respectively.

Table 2. Potential Shadow Flicker Summary, 750 ft from Turbine 38

Direction from Turbine	Days of Potential Impact per Year	Max Hours per Day[1]	Mean Hours per Day[2]	Total Annual Hours
North	92.00	1.62	0.13	11.90
Northeast	169.00	1.52	0.17	28.58
East	166.00	1.50	0.47	77.67
Southeast	0.00	0.00	0.00	0.00
South	0.00	0.00	0.00	0.00
Southwest	0.00	0.00	0.00	0.00
West	178.00	1.48	0.39	68.85
Northwest	160.00	1.53	0.23	36.03

1. Not reduced to account for cloud cover or turbine yaw direction; assumes sky is always clear and turbine is facing the sun.
2. Mean hours per day calculated only on days with potential impact. Days without impact are not factored into the average. Mean hours per day would be much lower if days with no potential impact were factored in.

Table 3. Potential Shadow Flicker Summary, 1000 ft from Turbine 38

Direction from Turbine	Days of Potential Impact per Year	Max Hours per Day[1]	Mean Hours per Day[2]	Total Annual Hours
North	30.00	0.62	0.04	1.28
Northeast	137.00	1.20	0.13	18.42
East	107.00	1.15	0.34	35.92
Southeast	0.00	0.00	0.00	0.00
South	0.00	0.00	0.00	0.00
Southwest	0.00	0.00	0.00	0.00
West	99.00	1.15	0.33	32.23
Northwest	128.00	1.20	0.17	22.13

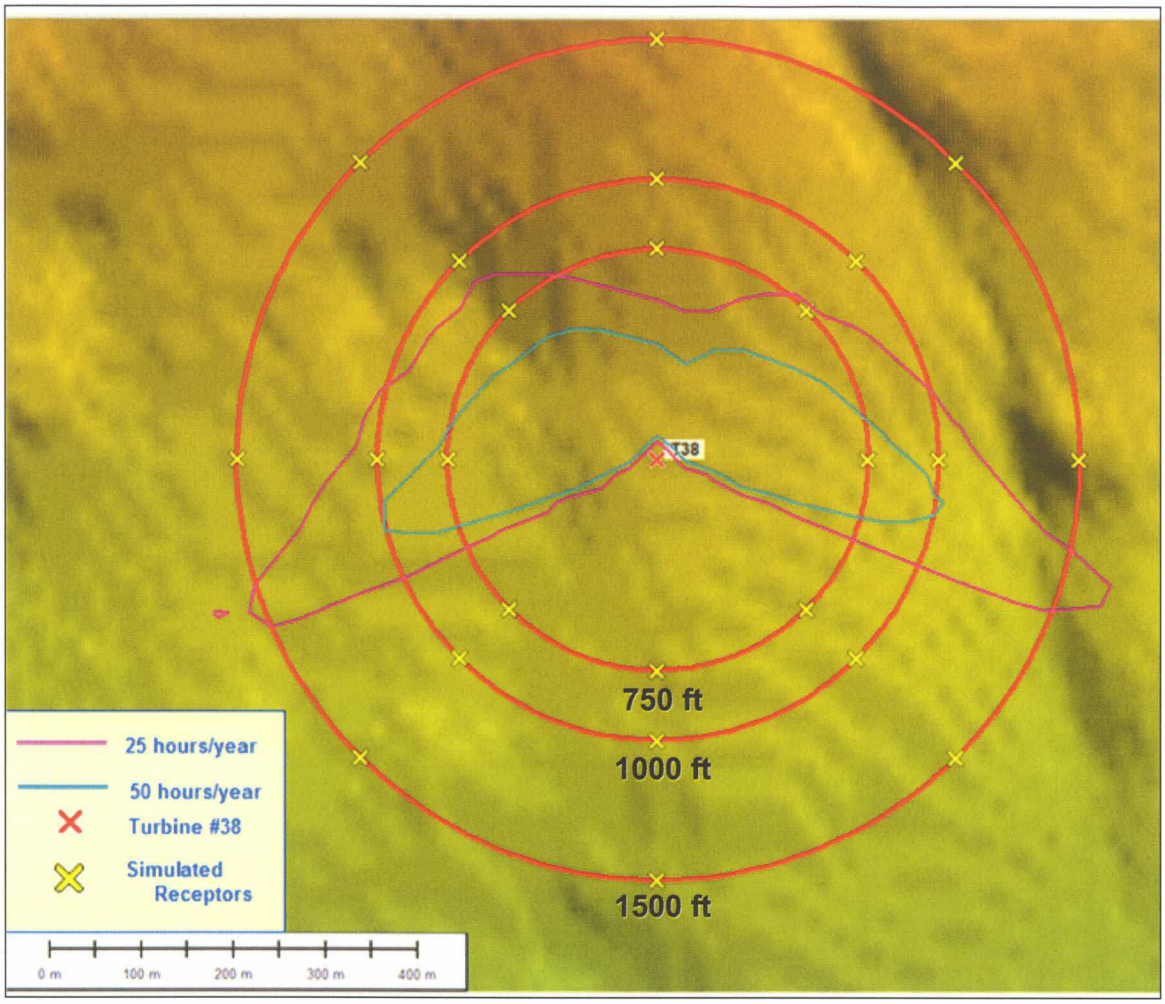
1. Not reduced to account for cloud cover or turbine yaw direction; assumes sky is always clear and turbine is facing the sun.
2. Mean hours per day calculated only on days with potential impact. Days without impact are not factored into the average. Mean hours per day would be much lower if days with no potential impact were factored in.

Table 4. Potential Shadow Flicker Summary, 1500 ft from Turbine 38

Direction from Turbine	Days of Potential Impact per Year	Max Hours per Day[1]	Mean Hours per Day[2]	Total Annual Hours
North	0.00	0.00	0.00	0.00
Northeast	98.00	0.83	0.09	8.83
East	65.00	0.78	0.22	14.35
Southeast	0.00	0.00	0.00	0.00
South	0.00	0.00	0.00	0.00
Southwest	0.00	0.00	0.00	0.00
West	62.00	0.78	0.22	13.55
Northwest	88.00	0.85	0.11	9.97

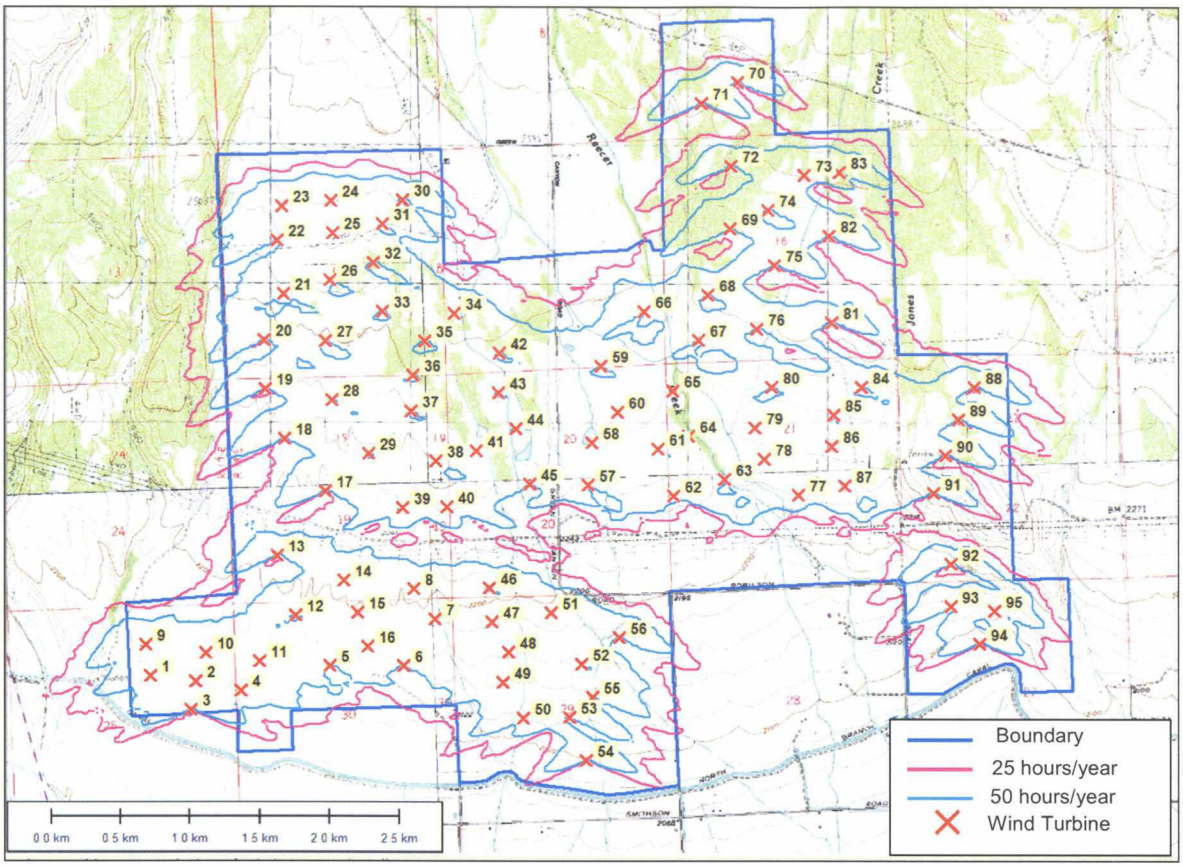
1. Not reduced to account for cloud cover or turbine yaw direction; assumes sky is always clear and turbine is facing the sun.
2. Mean hours per day calculated only on days with potential impact. Days without impact are not factored into the average. Mean hours per day would be much lower if days with no potential impact were factored in.

Figure 3 shows shadow flicker contours for a typical sole turbine (Turbine 38) on typical project terrain. The simulated receptor points on Figure 3 correspond to the measurement locations used to generate the results in Table 2, Table 3, and Table 4. Lines represent equal number of hours per year of shadow flicker. Almost all of the area with 50 or more annual hours of shadow flicker falls within 1000 ft of a turbine. Generally, the potential shadow flicker impacts at a distance of 1000 ft or greater from a turbine are limited to receptors located to the east to east-southeast or west to west-southwest of a turbine. Figure 4 shows a map of the entire project area with shadow flicker contours resulting from the additive shadow flicker effects of all turbines at the project. Less than 25 hours per year of potential shadow impacts are predicted outside the project boundary to the north or south. Some areas within about 1000 ft to the east or west of the project boundary have impacts exceeding 25 hours per year.



(lines represent equal number of hours per year of shadow flicker)

Figure 3. Shadow Flicker around a Typical Turbine (#38)



(lines represent area with equal hours per year of shadow flicker)

Figure 4. Shadow Contour Map of Desert Claim Project Area

Impacts on Identified Receptors

Next, DNV-GEC calculated the theoretical duration of shadow flicker at the nine residences that are located within 2500 feet of a turbine using WindPRO software. The residences are shown on a map in Figure 5. Shadows beyond about 1500 ft are not expected to cause shadow flicker because they will diffuse at that distance or greater, but the model did calculate a theoretical duration of shadow flicker. There are no residences located within 1500 feet of a turbine; therefore, it is DNV-GEC's best approximation that no shadow flicker impacts are expected at any of the residences.

Greenhouse-style windows are assumed, that is, the receptors are assumed to have windows facing each turbine. This is a conservative approximation and will tend to over-estimate impacts. Each set of results assumes the cloud cover data presented in Table 1, and assumes the turbine is yawed to various directions according to the annual direction distribution of the wind regime at the Desert Claim site. The results also take into account elevation differences, but not other structures or vegetation, and assume the turbines are always operating.

Table 5 shows the theoretical maximum shadow flicker effect, assuming perceptible flicker occurs beyond 1500 ft from a turbine. Exhibit A shows the corresponding calendar graphs for each receptor. At distances of 1500 ft and greater, the shadow flicker hours are limited to early and late in the day, when shadows are diffuse, and the turbine will generally appear as a distant object in front of the rising or setting sun, not an object casting a noticeable shadow. The resulting shadow flicker hours are due to the cumulative effect of shadow flicker from one or more turbines on a specific residence.

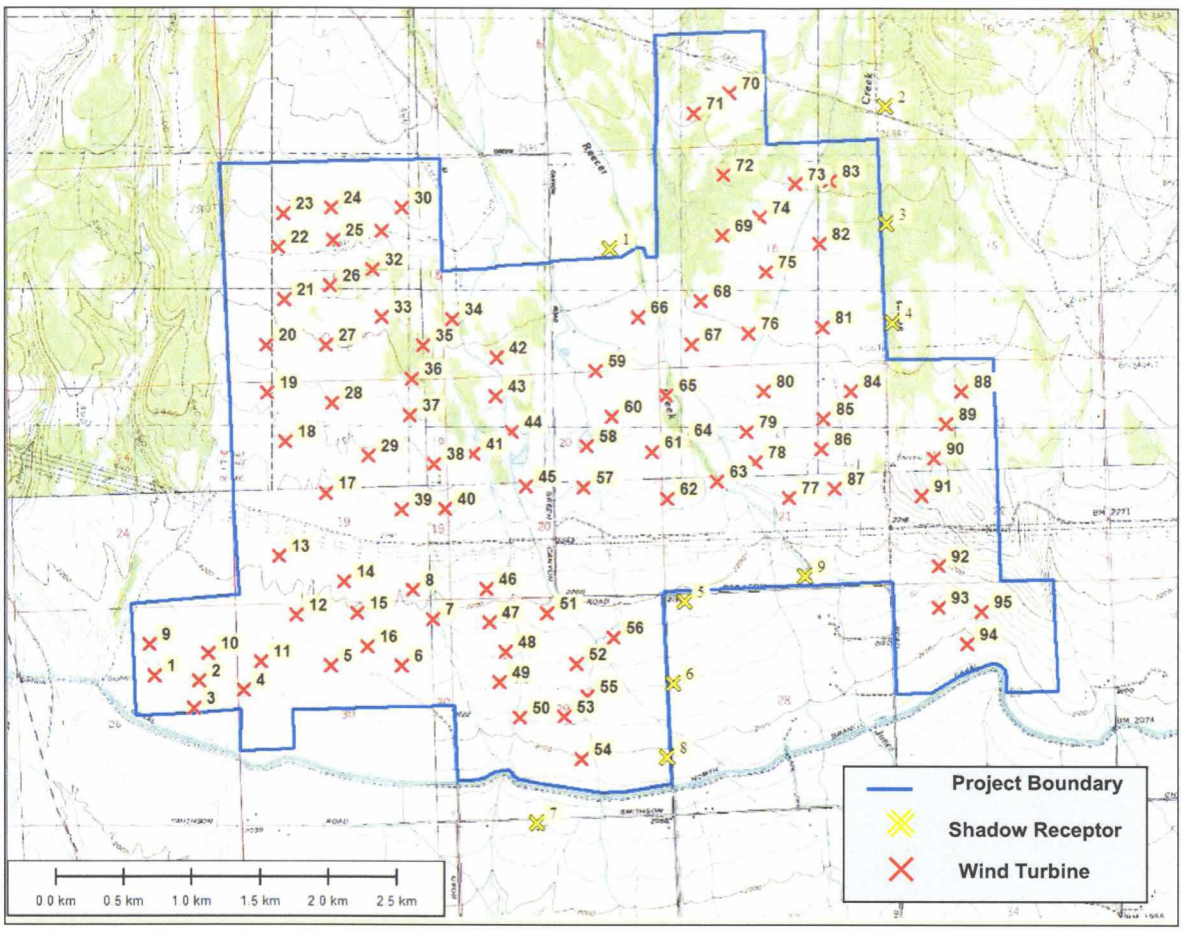


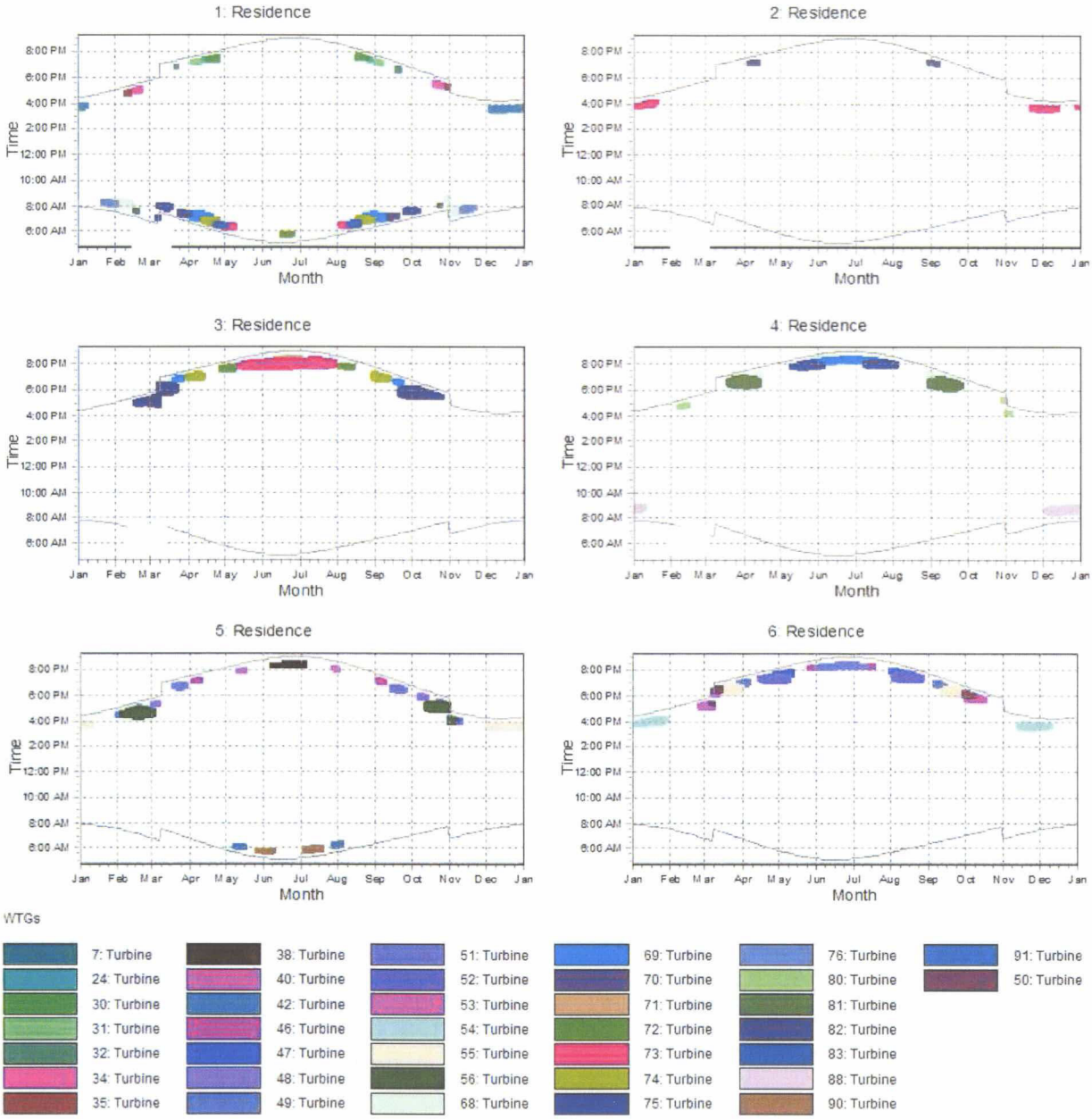
Figure 5. Desert Claim Shadow Receptors

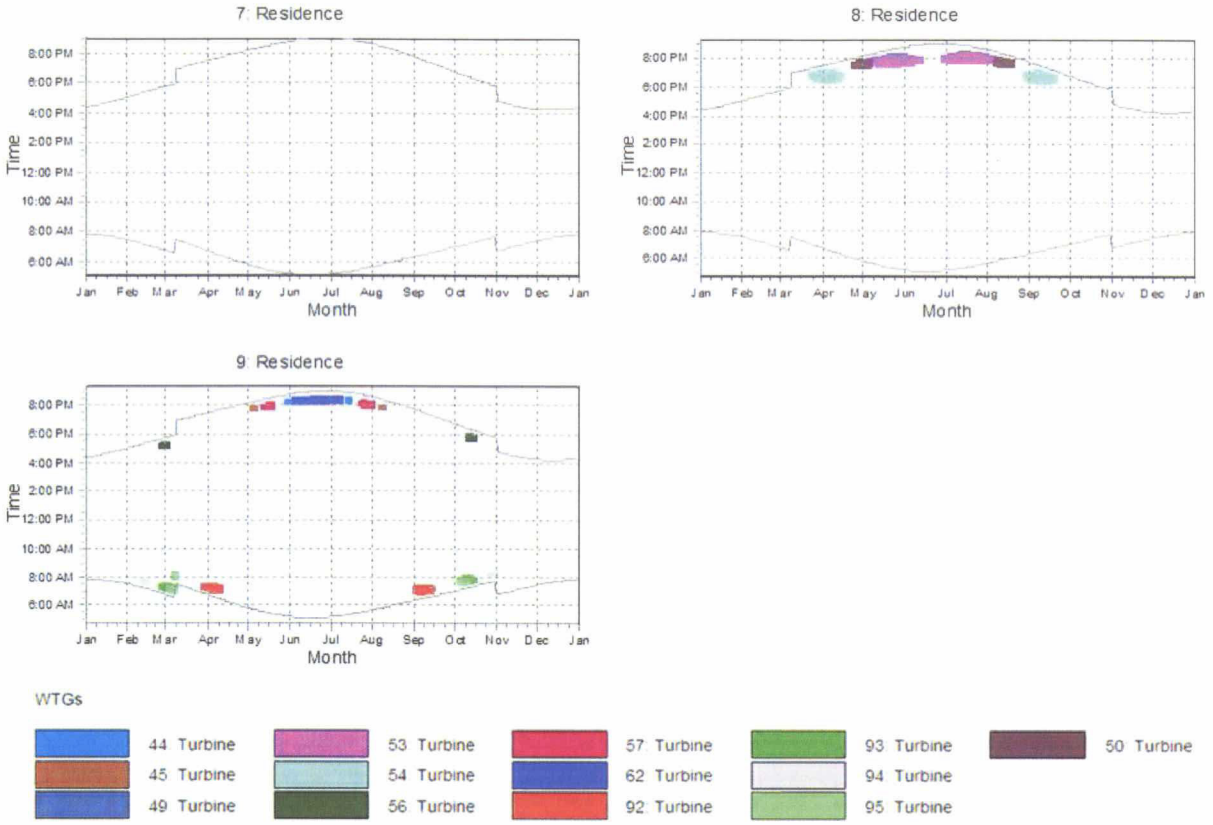
Table 5. Theoretical Shadow Flicker Duration, No Distance Diffusion Limit

Receptor	Days of Potential Impact per Year	Max Hours per Day[1]	Mean Hours per Day[2]	Total Annual Hours
1	222	0.60	0.07	14.87
2	57	0.15	0.01	0.85
3	205	0.70	0.13	26.03
4	194	0.70	0.10	19.85
5	215	0.50	0.05	10.12
6	242	0.57	0.08	20.17
7	0	0.00	0.00	0.00
8[3]	145	0.57	0.13	18.70
9[3]	113	0.32	0.05	5.27

1. Not reduced to account for cloud cover or turbine yaw direction; assumes sky is always clear and turbine is facing the sun.
2. Mean hours per day calculated only for days identified in column titled "Days per Year." Other days are not factored into the result. Mean hours per day would be much lower if other days were factored into the result.
3. Project participant residence located within Project area.

Exhibit A: Shadow Calendar Maps for Desert Claim, No Distance Diffusion Limit

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8: Residence
9: Residence
Time
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6:00 PM
4:00 PM
2:00 PM
12:00 PM
10:00 AM
8:00 AM
6:00 AM
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
WTGs
44 Turbine
45 Turbine
49 Turbine
53 Turbine
54 Turbine
56 Turbine
57 Turbine
62 Turbine
92 Turbine
93 Turbine
94 Turbine
95 Turbine
50 Turbine

AVIATION SYSTEMS INC.
Aviation Consultants

October 16, 2008

Mr. David Steeb
enXco -WA
PO Box 4
Woodinville, WA 98072

Re: Desert Claim Wind Project, 08-N-0248.WA.001 (A)

Dear Mr. Steeb:

Enclosed please find the list of proposed turbine locations along with lighting recommendations for each turbine in the Desert Claim Wind Project. This lighting plan was developed in compliance with the FAA Advisory Circular (AC) 70/7460-1K, Change 2 and on the basis of our discussions with FAA Regional offices regarding their current policy. However, final review by FAA could require some changes.

The lighting plan calls for the lighting of 41out of 95 wind turbines, the equivalent of 43% overall. Please note any changes to the project may require the development of a new lighting plan.

Sincerely,

Jerry Chavkin
Vice President, Airspace Operations

Enclosures: Wind Turbine List
Map

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enXco
08-N-0248.WA.001
DESERT CLAIM WIND TURBINES

Turbine ID	Longitude (NAD83)			Latitude (NAD83)			Recommended Marking/Lighting
1	-120	39	10.92	47	6	46.02	NONE
2	-120	38	55.33	47	6	44.50	NONE
3	-120	38	57.42	47	6	38.00	SFRL
4	-120	38	40.11	47	6	42.08	NONE
5	-120	38	9.70	47	6	47.16	SFRL
6	-120	37	44.76	47	6	46.77	SFRL
7	-120	37	33.56	47	6	57.46	NONE
8	-120	37	40.40	47	7	4.69	NONE
9	-120	39	12.16	47	6	53.46	SFRL
10	-120	38	51.81	47	6	51.04	SFRL
11	-120	38	33.60	47	6	48.75	SFRL
12	-120	38	20.89	47	6	59.31	NONE
13	-120	38	26.39	47	7	13.35	SFRL
14	-120	38	4.17	47	7	7.10	NONE
15	-120	37	59.91	47	6	59.39	NONE
16	-120	37	56.60	47	6	51.49	NONE
17	-120	38	9.46	47	7	27.94	SFRL
18	-120	38	22.91	47	7	40.46	NONE
19	-120	38	28.99	47	7	52.15	SFRL
20	-120	38	28.63	47	8	3.55	NONE
21	-120	38	21.75	47	8	14.16	SFRL
22	-120	38	23.38	47	8	26.60	NONE
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26	-120	38	5.77	47	8	17.04	NONE
27	-120	38	8.00	47	8	2.96	NONE
28	-120	38	6.29	47	7	49.19	NONE
29	-120	37	54.37	47	7	36.54	NONE
30	-120	37	40.18	47	8	35.14	SFRL
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36	-120	37	38.33	47	7	54.41	NONE
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41	-120	37	17.64	47	7	36.26	NONE
42	-120	37	8.60	47	7	58.91	SFRL
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46	-120	37	14.65	47	7	4.22	SFRL
47	-120	37	13.96	47	6	56.27	NONE
48	-120	37	8.54	47	6	49.16	NONE
49	-120	37	10.85	47	6	42.11	NONE
50	-120	37	4.50	47	6	33.57	SFRL

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enXco
08-N-0248.WA.001
DESERT CLAIM WIND TURBINES

Turbine ID	Longitude (NAD83)			Latitude (NAD83)			Recommended Marking/Lighting
51	-120	36	53.76	47	6	58.02	NONE
52	-120	36	44.10	47	6	45.93	NONE
53	-120	36	48.79	47	6	33.46	NONE
54	-120	36	43.31	47	6	23.27	SFRL
55	-120	36	40.56	47	6	38.08	SFRL
56	-120	36	30.84	47	6	51.74	SFRL
57	-120	36	39.82	47	7	27.54	SFRL
58	-120	36	38.28	47	7	37.38	NONE
59	-120	36	34.45	47	7	55.16	SFRL
60	-120	36	29.24	47	7	44.29	NONE
61	-120	36	15.58	47	7	35.55	NONE
62	-120	36	10.72	47	7	24.43	SFRL
63	-120	35	53.33	47	7	28.02	SFRL
64	-120	36	5.31	47	7	38.19	NONE
65	-120	36	10.14	47	7	48.85	NONE
66	-120	36	18.89	47	8	7.50	SFRL
67	-120	36	0.74	47	8	0.54	NONE
68	-120	35	57.14	47	8	10.96	SFRL
69	-120	35	48.79	47	8	26.23	SFRL
70	-120	35	44.81	47	9	0.14	SFRL
71	-120	35	57.41	47	8	55.48	SFRL
72	-120	35	47.77	47	8	40.74	NONE
73	-120	35	23.11	47	8	38.04	NONE
74	-120	35	35.75	47	8	30.27	NONE
75	-120	35	34.15	47	8	17.41	NONE
76	-120	35	40.89	47	8	2.75	NONE
77	-120	35	28.55	47	7	23.71	SFRL
78	-120	35	39.61	47	7	32.30	NONE
79	-120	35	42.50	47	7	39.62	NONE
80	-120	35	36.34	47	7	49.01	NONE
81	-120	35	15.26	47	8	3.70	SFRL
82	-120	35	15.35	47	8	23.75	SFRL
83	-120	35	11.16	47	8	38.50	SFRL
84	-120	35	5.89	47	7	48.37	SFRL
85	-120	35	15.66	47	7	42.13	NONE
86	-120	35	16.70	47	7	34.99	NONE
87	-120	35	12.71	47	7	25.51	SFRL
88	-120	34	27.52	47	7	47.63	SFRL
89	-120	34	33.41	47	7	40.11	NONE
90	-120	34	37.96	47	7	31.91	NONE
91	-120	34	42.58	47	7	23.23	SFRL
92	-120	34	37.41	47	7	6.53	SFRL
93	-120	34	37.67	47	6	56.65	NONE
94	-120	34	28.39	47	6	47.77	SFRL
95	-120	34	22.92	47	6	55.40	NONE

SFRL - Simultaneously Flashing Red Lights
NONE - Unlit/White Paint Only.
All Turbine Structures are White.

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REVISED
SUPPLEMENTAL REGULATORY INFORMATION

WAC 463-60-075. General — Assurances.

The application shall set forth insurance, bonding or other arrangements proposed in order to mitigate for damage or loss to the physical or human environment caused by project construction, operation, abandonment, termination, or when operations cease at the completion of a project's life. The application shall describe the applicant's commitment to the requirements of chapter 463-72 WAC, Site restoration and preservation.

Insurance:

The Applicant will establish or cause to be established and maintained, policies of insurance during the construction and operation of the Project. Such forms of insurance will be established and maintained as required by state and federal law, customary business practices, and third-party participants and lenders. The following coverage will be included:

- Commercial General Liability Insurance:

The construction contractor and subcontractors or the Applicant will be required to carry commercial general liability insurance, including products and completed operations to respond to liability and property damage claims arising during the construction and startup phase of the Project.

The Applicant will obtain and maintain in full force and effect, commercial general liability insurance against claims for liability and property damage arising out of the use and occupancy of the premises.

The Applicant will purchase insurance policies to cover liabilities arising from casualty and other major incidents.

- Automobile Insurance:

The construction contractor and subcontractors will be required to carry automobile liability insurance covering all owned, leased, non-owned and hired automobiles used during the construction and startup phase of the project.

The Applicant will obtain and maintain in full force and effect automobile liability insurance covering owned, non-owned and hired autos.

- Property Insurance:

The Applicant will obtain and maintain, at all times during the term of construction and operation of the Project, physical damage insurance on the buildings and all improvements that are to be erected on the premises on an "all risk" basis, including coverage against damage or loss caused by earth movement and flood with insured values that are standard to the insurance industry for such improvements.

Upon completion of Project construction, the Applicant will likely be required by its customers or lenders to maintain specific forms of business interruption coverage to ensure continued operation of the Project.

- Machinery Insurance:

The Applicant will obtain and maintain machinery insurance at all times during the term of construction, including testing, and operation of the facility. Coverage will be written on a comprehensive form for all insurable objects, including all production machinery located on or adjacent to the property in a minimum amount equal to the maximum foreseeable loss, and including expediting expenses, extra expense and business income.

- Worker's Compensation and Washington Stop Gap Liability:

The Applicant will comply with the worker's compensation and unemployment laws as required with respect to any employees performing work on the Project property and premises. The Applicant will also insure for exposure under Washington Stop Gap Liability. The Applicant will require that the construction contractor and subcontractors working on the Project similarly comply with the worker's compensation and unemployment laws with respect to their employees performing work on the subject property and premises. The Applicant also will require insurance for exposure under Washington Stop Gap Liability.

Environmental Impairment

The Applicant will be responsible, as required by law, for acts of environmental impairment related to the ownership and operation of the Project. Such losses may, in some circumstances, be covered by liability insurance, which the Applicant and/or the construction contractor will carry. In addition, the Applicant and/or its contracted operator will obtain environmental impairment liability insurance to the extent such coverage is commercially available. This insurance will cover the acts of the Applicant and its operators at the Project site, consistent with prevailing wind power industry standards for such insurance. Commercial availability is determined by reference to the norm of the industry.

Project Site Abandonment:

If the Project were to terminate operations, the Applicant would obtain necessary authorizations to decommission the facilities. A Final Site Restoration Plan would be developed and submitted to EFSEC. Experience in other regions with older wind power projects indicates that a non-operating wind power project does not present any significant threats or risks to public health and safety or environmental contamination.

Experience with older wind plants that have been decommissioned or re-powered has shown that the scrap value of the materials and equipment contained in the Project infrastructure (steel towers, electric generators, steel, copper, etc.) would likely exceed the cost of dismantling the Project, based on historic and current scrap prices. The Applicant will provide adequate financial assurances to cover anticipated costs associated with decommissioning the Project.

WAC 463-60-085(2) Fair treatment.

The application shall describe how the proposal's design and mitigation measures ensure that no group of people, including any racial, ethnic, or socioeconomic group, bear a disproportionate share of the environmental or socioeconomic impacts resulting from the construction and operation of the proposed facility.

The Project has been designed to avoid or minimize adverse impacts to individuals or group of people. There is no reason to believe that any racial, ethnic or socioeconomic group will bear a disproportionate share of the Project's impacts. On the contrary, the FEIS describes substantial economic benefits that will be experienced in Kittitas County and Washington State as a result of the Project.

WAC 463-60-101 General — Consultation.

(1) Preapplication consultation. The application shall summarize all consultation that the applicant has conducted with local, state and federal agencies and governments, Indian tribes, nonprofit organizations and community citizen and interest groups prior to submittal of the application to the council.
(2) Meaningful involvement. The application shall describe all efforts made by the applicant to involve the public, regardless of race, ethnicity, or socioeconomic status, prior to submittal of the application to the council. The application shall also set forth information for contacting local interest and community groups to allow for meaningful involvement of all people, regardless of race, ethnicity or socioeconomic status. For example, such information may include contacts with local minority radio stations and news publications

The SEPA process conducted by the Kittitas County Department of Community Development Services included extensive consultation with local, state and federal agencies

as well as tribal representatives. This consultation is summarized in Chapter 6 of the County FEIS.

In addition, the Applicant has involved the public, community leaders, organizations and Kittitas County officials throughout the development of the Project. The following is a summary of meetings the Applicant has had with the public and community organizations:

May 14 and 15, 2003	Open House in Ellensburg
2003 – 2004	Meetings with Kittitas County Economic Development Group
April 14, 2004	Ellensburg Rotary Club Meeting
April 20, 2004	Ellensburg Lion's Club Meeting
April 27, 2004	Ellensburg Kiwanis Club Meeting
May 19, 2004	Upper County Rotary Club Meeting
May 26, 2004	Ellensburg School Board Meeting
June 14, 2004	Ellensburg Kiwanis Club Meeting
June 23, 2004	Cle Elum Kiwanis Meeting
Dec. 2004 – Feb. 2005	Meetings with Kittitas County Fire District No. 2
Oct. 29, 2007	Ellensburg Kiwanis Club Meeting
Nov. 13, 2007	Ellensburg Kiwanis Club Meeting
Nov. 27, 2007	Ellensburg Rotary Club Meeting
Jan. 16, 2008	Upper County Rotary Club Meeting
Feb. 17, 2008	Kittitas County League of Women Voters Meeting
June 6, 2008	Ellensburg Open House

The following is a summary of meetings and hearings the Applicant has had with Kittitas County Department of Community Development Services, Planning Commission and Board of County Commissioners:

August 6, 2002	Pre-application meeting with Kittitas County Department of Community Development Services (CDS) staff
September 25, 2002	Meeting with CDS regarding application and permit process
November 14, 2002	Meeting with CDS regarding application and permit process
January 15, 2003	Meeting with CDS, Building Department and Public Works Director
February 19, 2003	Meeting with CDS regarding application
February 27, 2003	Meeting with CDS and WDFW staff regarding mitigation issues
March 25, 2003	Meeting with CDS regarding EIS
April 8, 2003	Meeting with County's EIS consultant
May 7, 2003	Kittitas County EIS Scoping meeting
May 14, 2003	Kittitas County open house and community meeting for project
June 24, 2003	Meeting with CDS, County attorney and EIS consultant regarding Draft EIS
August 12, 2003	Meeting with CDS, County attorney and EIS consultant regarding Draft EIS
August 26, 2003	Meeting with CDS regarding Draft EIS
September 3, 2003	Meeting with CDS, County attorney and EIS consultant regarding Draft EIS
September 9, 2003	Meeting with CDS, County attorney and EIS consultant regarding Draft EIS
September 24, 2003	Kittitas County Open House regarding project
October 29, 2003	Meeting with CDS and County attorney regarding Development Agreement

December 1, 2003	Meeting with County EIS consultant regarding Draft EIS
January 16, 2004	Meeting with CDS and WDFW staff regarding mitigation
January 20, 2004	Kittitas County hearing on Draft EIS
February 10, 2004	Meeting with CDS, County attorney and EIS consultant regarding SEPA process
March 16, 2004	Meeting with CDS and Director of Public Works regarding airport and Smithson Road issues
May 3, 2004	Meeting with Director of Public Works regarding Smithson Road issues
May 4, 2004	Meeting with Bowers Field Airport Advisory Committee, CDS and Director of Public Works regarding airport issues
May 26, 2004	Meeting with CDS and County attorney regarding Final EIS
June 1, 2004	Meeting with CDS regarding Pheasant Lane issues
June 15, 2004	Meeting with CDS and Director of Public Works regarding Pheasant Lane issues
August 10, 2004	Meeting with CDS regarding Final EIS
September 13, 2004	Meeting with CDS regarding Development Agreement
September 30, 2004	Meeting with County Planning Department staff regarding Development Agreement
October 11, 2004	Meeting with County EIS consultant regarding Development Agreement
October 20, 2004	Meeting with CDS, County attorney and EIS consultant regarding the staff report and Development Agreement
October 25-26, 2004	Kittitas County Planning Commission and Board of County Commissioners (BOCC) joint hearings regarding application.
October 27, 2004	BOCC hearing

November 8-9, 2004	BOCC hearing
November 11, 2004	Meeting with Public Works Director
November 18, 2004	BOCC hearing
November 29, 2004	Meeting with CDS and County attorney
December 7, 2004	BOCC hearing
December 8, 2004	Meeting with CDS
December 14, 2004	Meeting with County EIS consultant regarding Development Agreement
December 15, 2004	Meeting with CDS regarding Development Agreement
December 27, 2004	BOCC hearing
January 11, 2005	BOCC hearing
January 20, 2005	BOCC hearing
January 25, 2005	Meeting with CDS regarding Development Agreement
January 27, 2005	BOCC hearing
February 15, 2005	BOCC hearing
March 1, 2005	BOCC hearing
March 9, 2005	BOCC hearing
March 29, 2005	BOCC hearing
October 24, 2006	Individual meetings with Kittitas County Commissioners to discuss changes in Project
May 17, 2007	Meeting with CDS and County attorney

WAC 463-60-135 Proposal — Legal descriptions and ownership interests.

(1) Principal facility. The application shall contain a legal description of the site to be certified and shall identify the applicants and all nonprivate ownership interests in such land.
(2) Associated and transmission facilities. For those facilities described in RCW 80.50.020 (6) and (7) the application shall contain the legal metes and bounds description of the preferred centerline of the corridor necessary to construct and operate the facility contained therein, the width of the corridor, or variations in width between survey stations if appropriate, and shall identify the applicant's and others' ownership interests in lands over which the preferred centerline is described and of those lands lying equidistant for 1/4 mile either side of such center line.

The Project Area comprises portions of Township 19N, Range 18E, Sections 9, 16, 17, 18, 19, 20, 21, 22, 27, 29 and 30, along with the northwest corner of Township 19N, Range 17E, Section 25.

Of the 5,200 acres within the Project Area, 2,551 acres are privately owned by four landowners, 1,529 acres are owned by WDNR and 1,120 will be owned by an enXco affiliate. One parcel has a severed estate in which a private party owns the surface and WDNR controls the mineral rights

The legal description for the WDNR land is:

> All of Section 16, Township 19 North, Range 18 East, W.M., All of Section 18, Range 19 North, Range 18 East, W.M., and the Western Half of Section 22, Range 19 North, Range 18 East, W.M.

The legal description for the Nelson property is:

> The North Half of Section 27, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington, EXCEPT:
> 1. The Southeast Quarter of the Northeast Quarter,
> 2. Tracts of land conveyed to the Kittitas Reclamation District by deed dated December 16, 1927, recorded in book 46 of Deeds, page 106, and by deed dated March 4, 1929, recorded in book 47 of Deeds, page 255 and by deed dated March 5, 1929, and recorded in book 47 of Deeds, page 256;
> 3. Parcels 1 and 2 of that certain Survey recorded August 6, 1993, in Book 19 os Surveys, pages 120 and 121, under Auditor's File No. 562115, being a portion of the Northeast Quarter of Section 27, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington;
> 4. Right of way for Robbins Road (also shown of record as Evans Road);
> 5. Right of way for Reecer Creek Road.

The legal descriptions for the three parcels of the Wade/White property are:

PARCEL D:

The Southwest Quarter of Section 17, Township 19 North, Range 18 East, W.M., Kittitas County, State of Washington;
EXCEPT the north one rod of the Northeast Quarter of the Southwest Quarter of said section,
EXCEPT the North 5 rods of the Northwest Quarter of the Southwest Quarter of said section; and
EXCEPT the right of way of Reecer Creek Road along the East line, thereof.

PARCEL E:

The West Half of Section 20, Township 19 North, Range 18 East, W.M., Kittitas County, State of Washington;
EXCEPT right of way of Reecer Creek Road along the East boundary thereof.

PARCEL F:

All of the North Half and the portion of the South Half of Section 29, Township 19 North, Range 18 East, W.M., Kittitas County, State of Washington, lying North of and above the North line of the North Branch Canal of the Kittitas Reclamation District;
EXCEPT the right of way of Reecer Creek Road along the North line thereof and right of way of Lower Green Canyon Road along the East line thereof.

The legal description for the Doman property is:

The Southwest Quarter of Section 9, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington.

The legal description for the Roan property is:

PARCEL 1:

The Southeast Quarter of Section 17, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington;

AND

That part of the South Half of the Northeast Quarter of Section 17, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington, which is described as follows:

A tract of land bounded by a line beginning at a point on the East boundary line of the right of way of the county road 30 feet East and 16.5 feet North of the Southwest corner of said Northeast Quarter of said section and running thence North 89 degrees 15' East parallel with the South line of said quarter section 1714 feet; thence North 61 degrees 33' East 398.2 feet; thence South 84 degrees 15' East 188 feet; thence South 23 degrees 15' East 177 feet to a point on the South boundary line of said section; thence South 89 degrees 15' West along said South boundary line of said section 2329.5 feet; and thence North 16.5 feet to the point of beginning;
EXCEPT a strip of land 12 feet wide lying South of a line described as follows: Beginning at a point 30 feet East and 16.5 feet North of the Southwest corner of said section and running thence North 89 degrees 15' East 1714 feet; thence North 61 degrees 33' East 398.2 feet; thence South 84 degrees 15' East 188 feet; and thence South 23 degrees 15' East 177 feet to a point on the South boundary line of said section;

AND

The East Half of Section 20, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington.

PARCEL 2:

The South Half and that portion of the North Half of Section 21, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington, which is described as follows:
A tract of land bounded by a line beginning at a point on the West boundary line of the Northeast Quarter of said section, 4 rods North of the Southwest corner of said quarter section, and running thence East 4 rods; thence North on a line parallel with the West boundary line of said quarter section 100 rods; thence West 4 rods to the West boundary line of said quarter section; thence North to the North boundary line of said quarter section; thence West to the Northwest corner of said section; thence South on the West boundary line of said section to the Southwest corner of the Northwest Quarter of said section; thence East on the South boundary line of said Northwest ¼ of said section 60 rods; thence North 4 rods; and thence East on a line parallel with the South boundary line of said quarter section 100 rods to the point of beginning.

AND

That portion of the South Half of the Northwest Quarter of Section 21, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington, which is described as follows:
A tract of land beginning at the Southwest corner of the Northwest Quarter of said

section; thence East on the South boundary line of said Northwest Quarter of said section, 60 rods to the true point of beginning; thence North 4 rods; thence East on a line parallel with the South boundary line of said quarter section, 100 rods, to the East boundary line of said Northwest Quarter of said section; thence South 4 rods to the South boundary line of said quarter section; and thence West on the South boundary line of said Northwest Quarter of said section, 100 rods to the true point of beginning.

AND

The Northeast Quarter of Section 21, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington;
EXCEPT a tract of land bounded by a line beginning at a point on the West boundary line of said quarter section which is 4 rods North of the center of said section, and running thence East 4 rods; thence North on a line parallel with and 4 rods distant from the West boundary line of said quarter section 100 rods; thence West 4 rods to the West boundary line of said quarter section; and thence South along said West boundary line 100 rods to the point of beginning.

The legal descriptions for the parcels of property to be owned by an enXco affiliate are:

PARCEL 1:

THE NORTHEAST QUARTER OF SECTION 25, TOWNSHIP 19 NORTH, RANGE 17 EAST, W.M., IN THE COUNTY OF KITTITAS, STATE OF WASHINGTON.

PARCEL 2:

ALL OF SECTION 19, TOWNSHIP 19 NORTH, RANGE 18 EAST, W.M., IN THE COUNTY OF KITTITAS, STATE OF WASHINGTON;

PARCEL 3:

THE NORTH HALF, THE NORTH HALF OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER, AND THE NORTH HALF OF THE NORTH HALF OF THE SOUTH HALF OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 19 NORTH, RANGE 18 EAST, W.M., IN THE COUNTY OF KITTITAS, STATE OF WASHINGTON.

WAC 463-60-285 Proposal — Study schedules.

The application shall furnish a brief description of all present or projected schedules for additional environmental studies. The studies descriptions should outline their scope and indicate projected completion dates.

The Applicant has no current plans to perform additional environmental studies.

WAC 463-60-295 Proposal — Potential for future activities at site.

The application shall describe the potential for any future additions, expansions, or further activities which might be undertaken by the applicant on or contiguous to the proposed site.

The Applicant has no plans to add to, expand or conduct additional activities on the Project Area in the future. Although there is the potential for further expansion on contiguous or adjacent lands, the Applicant has no current plans for such an expansion. Any future expansion would depend upon landowner consent, market demand, turbine pricing, and the ability to obtain required regulatory approvals.

WAC 463-60-297 Proposal — Pertinent federal, state and local requirements.

(1) Each application shall include a list of all applicable federal, state, and local statutes, ordinances, rules, permits, and required use authorizations (i.e., leases, easements, rights of way, or similar authorizations) that would apply to the project if it were not under council jurisdiction. For each federal, state, or local requirement, the applicant shall describe how the project would comply or fail to comply. If the proposed project does not comply with a specific requirement, the applicant shall discuss why such compliance should be excused.
(2) Inadvertent failure by the applicant to discover and list a pertinent requirement shall not invalidate the application, but may delay the council's processing of the application.

The following is a summary of major federal, state and local statutes, regulations, permits and approvals that would be applicable to the Project if it were not under EFSEC's jurisdiction.

Federal Statutes, Regulations, Rules and Permits

Aviation Regulations & Lighting (49 USC 44718, 14 CFR 77)

The Federal Aviation Administration (FAA) requires filing of Notice of Proposed Construction or Alteration and completion of a study for objects, such as wind turbines, that may pose a hazard to aviation (Advisory Circular No. 70/460-2H). This standard is

applicable to any object over 200 feet above ground level. The FAA has also promulgated standards for the marking and lighting of such objects (Advisory Circular No. 70/7460-1K).

The proposed site is in the vicinity (within 6 nautical miles) of Bowers Field, located in Kittitas County near Ellensburg. Federal Aviation Regulation (FAR) 77.23 would require that FAA conduct a study of the proposed project.

The Applicant will file a Notice of Proposed Construction or Alteration with the FAA, and comply with FAA's preferred lighting system for wind turbines. The FAA will determine, based on the plan submitted by the Applicant, how many turbines should be lighted. A lighting plan prepared pursuant to FAA regulations is provided in Tab 9 of the Revised Application.

Endangered Species Act (16 U.S.C. 1533) (1973), Bald Eagle and Golden Eagle Protection Act (1940)

The Endangered Species Act (ESA) requires the protection and recovery of threatened and endangered species. The National Oceanic and Atmospheric Administration (NOAA) administers the ESA for species with ocean habitats or for anadromous fish species, while the US Fish and Wildlife Service (USFWS) has ESA responsibility for all other species. NOAA and USFWS designate critical habitat for species that are identified as threatened or endangered or that are listed as potentially threatened or endangered. Section 7 of the ESA requires federal agencies to assess the effect of their proposed actions on listed species and consult with NOAA and/or USFWS, as applicable. Section 9 makes it unlawful to 'take' endangered species. Take is defined to include harm, harassment, and habitat modification or degradation. Section 10 enables interested parties to obtain a regulatory certainty (i.e., a take permit) in exchange for voluntary measures that conserve protected animals. 'Incidental take' or 'enhancement of survival' permits allow lawful activities that might unintentionally harm a species to proceed under a habitat conservation plan, candidate conservation agreement, or a safe harbor agreement.

The Bald Eagle and Golden Eagle Protection Act protects the bald eagle and golden eagle and imposes its own prohibition on any taking of these species. 'Take' is defined by actions to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb these species.

The SEIS, the County FEIS and the Revised Vegetation and Wildlife Report provided in the Revised Application (Tab 5) address potential impacts to plants and wildlife that are listed, or are candidates for listing, as threatened or endangered and that may occur on or near the Project Area.

Clean Water Act (42 USC 1251, 15 CFR 923-930)

The goals of the Clean Water Act are to eliminate the discharge of pollutants into surface waters and to achieve a level of water quality that provides for the protection of fish and wildlife. The major implementing elements of the Act are a prohibition on non-complying discharges (Section 301), a permit program to authorize and regulate discharges (Section 402), a system to determine the limitations to be imposed (Sections 301, 306, 307), standards and implementing provisions (Sections 401, 402), a system for preventing and responding to spills (Section 311), and enforcement mechanisms (Sections 309, 505).

The U.S. Environmental Protection Agency (EPA) and Washington Department of Ecology (Ecology) oversee most provisions of the Clean Water Act. The National Pollution Discharge Elimination System (NPDES) permit program is a primary component of the Act. An NPDES permit is required for any discharge of pollutants from a point source, including stormwater runoff, to waters of the United States. Section 404, which is administered by the U.S. Army Corps of Engineers, regulates the discharge of dredge and fill materials to waters of the United States, including associated wetlands. EFSEC has delegated authority to issue NPDES permits and Section 401 certification for projects under its jurisdiction.

The Project will require an NPDES permit to manage stormwater discharges during construction. The Project will not require a Section 404 permit because, as discussed in greater detail in the Wetland and Stream Impact Analysis found at Tab 4 of the Revised Application, it will not result in any fill of or disturbance to jurisdictional wetlands.

National Historic Preservation Act (PL 90-577) (1966)

The National Historic Preservation Act protects historic sites and values (in cooperation with other nations, states, and local governments) as federal policy. It generally establishes a grant program to states for historic preservation and requires federal agencies to consider the effects of their actions on historic resources. Agencies can require private interests to pay costs of protecting archaeological and historic resources. Historic resources are identified by literature searches, sample evaluation and site surveys.

Federal criteria provide a useful way to measure the scientific or historic value of properties. Properties eligible for the National Register of Historic Places generally must be at least fifty years old, possess integrity of physical characteristics, and meet at least one of four criteria of significance. (The criteria are discussed in detail in Section 3.6 of the County FEIS.)

Cultural and historic resources within the original Project Area were described in the County FEIS. The Applicant has retained a consultant to identify cultural and historic resources on the additional properties included in the revised Project Area, and that analysis will be summarized in the SEIS. Potential project impacts on these resources and associated mitigation measures are identified in the County FEIS, Section 3.6 and will be identified in the SEIS.

State Statutes, Regulations, Rules and Permits

Indian Sites and Resources Act; Indian Graves and Records Act

The Indian Sites and Resources Act (RCW 27.53) and the Indian Graves and Records Act (RCW 27.44) address cultural resources pertaining to the Indian history within Washington. RCW 27.53 prohibits the disturbance or excavation of historic or prehistoric archaeological resources on state or private land without a permit. RCW 27.44 prohibits knowingly disturbing a Native American or historic grave.

The Project involves a number of ground-disturbing activities that have the potential to directly impact cultural resources within the Project Area. Section 3.6 of the County FEIS analyzes existing cultural resources and potential impacts within the original project area. The Applicant has retained a consultant to provide a similar analysis of the additional properties included in the revised Project Area, and that analysis will be summarized in the SEIS. Protocols and procedures would be implemented to address any discovery of Indian resources.

Electrical Construction Permit

The Washington Department of Labor & Industries has adopted regulations regarding safety and installation of electric wires and equipment (WAC 296-746A). The Department reviews applicable design plans, issues construction permits for compliant systems, and enforces its regulations.

The Project will be designed, constructed and operated in accordance with Department of Labor & Industries' regulations.

Sound Level Regulations

The Washington Department of Ecology has established limits on sounds crossing property boundaries based on an Environmental Designation for Noise Abatement (EDNA). (WAC ch. 173-60) EDNAs are established based on the land use and/or zoning classification of the sending and receiving properties.

The Project will comply with WAC chapter 173-60. A revised sound analysis is provided at Tab 6 of the Revised Application.

Water Quality

State water quality requirements are found in RCW 90.48 (Water Pollution Control Act), WAC 173-220 (Ecology's NPDES Permit Program), WAC 173-226 (Waste water General Permits) and 173-201A (Water Quality Standards for Waters of the State). See discussion of

the federal NPDES program above. The proposal would require a General NPDES Construction Stormwater Permit, which may be issued by EFSEC (per WAC 463-38).

The Applicant will develop and implement a Stormwater Pollution Prevention Plan (SWPPP) and comply with other requirements of the General Permit.

Fish & Wildlife Priority Species & Habitats

The Washington Department of Fish & Wildlife designates priority species and habitats and describes guidelines for management (WAC 232-12). Priority species of plants and wildlife are located in the Project Area. Detailed information on specific species is found in the County FEIS at pages 3-63 through 3-113, and in the Vegetation and Wildlife report provided at Tab 5 of the Revised Application.

The Applicant will follow WDFW guidelines for Wind Power Projects.

State Environmental Policy Act (RCW 43.21C & WAC 197-11)

SEPA requires state and local governments to give appropriate consideration to environmental values in decision making. SEPA requires the preparation of an Environmental Impact Statement (EIS) before state and local governments take major actions significantly affecting the quality of the environment.

Kittitas County published a Final EIS in August 2004, as the SEPA lead agency for the original project proposal. No appeal of the EIS was filed. EFSEC is the SEPA lead agency for the current application. EFSEC has issued a a Notice of Adoption of the County FEIS and a Notice that it will be preparing a SEIS.

Pertinent Local Statutes, Regulations, Rules and Permits

Kittitas County Comprehensive Plan (1996, as amended)

In 1996, Kittitas County adopted a Comprehensive Plan that contains the County's goals for managing growth and development over a 20-year period (1996 to 2016). It includes general goals and policy statements for five major elements, including: land use, housing, transportation, capital facilities, and utilities. The land use and utility policies are the most relevant to the Project and are summarized and discussed below.

Land Use Goals & Policies

The Land Use section includes designations and policies for guiding land use in the County. Land use designations establish general locations for specific land use and development activities throughout the County. The Project Area and much of the surrounding area is designated as Rural in the Comprehensive Plan, except for areas to the north and northwest,

which are designated as Commercial Forest. The Plan identifies the importance of natural resource activities, as they contribute to the County's economic base.

Chapter 8, Section 8.5, of the Comprehensive Plan states, "Rural lands in Kittitas County are now, and have historically been, a mix of resource lands, rural neighborhoods, and varied developments scattered throughout the county." The Plan's goals, policies, and objectives for land uses on rural lands are "established in an attempt to prevent sprawl, direct growth toward the Urban Growth Areas and Nodes, provide for a variety of densities and uses, respect private property rights, provide for residences, recreation, and economic development opportunities, support farming, forestry and mining activities, show concern for shorelines, critical areas, habitat, scenic areas, and open space while keeping with good governance and the wishes of the people of Kittitas County and to comply with the GMA and other planning mandates."

The Comprehensive Plan states that utilities using natural resources may be appropriate in rural areas:

> *The economy of our rural community has traditionally been based on natural resource activities and Kittitas County encourages and supports their continuation in Rural Lands.... Economically viable farming and logging may occur with or beyond the state designated areas but more and more it is necessary to supplement income from outside sources in order to support natural resource operations. Other businesses and economic growth can be realized without sacrificing our rural character.*

The Project is consistent with these Land Use goals and policies of the Comprehensive Plan. The Project would not directly change or replace existing agricultural uses or adversely affect the pattern of rural uses in the surrounding area. Wind projects are a relatively new and innovative type of energy or utility use that would support economic growth and generate revenues to Kittitas County and junior taxing districts.

Utilities Goals & Policies

The Utilities section of the Comprehensive Plan identifies the general location and capacity of all existing and proposed utilities, including but not limited to, electrical lines, telecommunication lines, and natural gas lines. Generally, the goals, policies, and objectives seek to promote the maintenance of current information on existing and proposed facilities; plan for expansion or improvement of utility systems; encourage coordination between jurisdictions and utility providers; and ensure the proper placement and appropriateness of utility siting.

The Project is consistent with the Utilities goals and policies of the Comprehensive Plan. It is located within the Comprehensive Plan's designated Rural Area and would produce electricity to meet regional energy demands. The Project will connect to an existing electric

transmission line, and proximity to a transmission line is a key criterion for siting wind energy facilities. Electricity generated by wind turbines will be collected through cables that run above or below the ground in the project area or within utility rights-of-way to an on-site substation. Most of the power collection lines will be located within the Project Area.

Kittitas County Zoning Code (Title 17)

The Zoning Code regulates the use and development of all property within the unincorporated area. The land within the Project Area is zoned either Ag-20 (agricultural use with a 20-acre minimum parcel size) or Forest & Range (allowing residential development with a minimum of 20 acres per dwelling).

Wind projects are not a permitted use in any Kittitas County zoning district. Instead, Kittitas County has adopted an ordinance that establishes a siting process for wind projects. In order to construct a wind project, the proponent must apply for a site-specific rezone and modification of the County Comprehensive Plan to designate the project site as a Wind Farm Resource Overlay Zone, as well as obtaining a Wind Resource Development Permit and executing a development agreement (KCC, Chapter 17.61A). Kittitas County has also more recently "pre-identified" an area in the eastern portion of the County as suitable for siting wind projects (Kittitas County Code 17.61A.035). Projects located within this new pre-identified area can be permitted through a different County process.

In 2003, Desert Claim applied to Kittitas County for the approvals necessary to construct and operate an earlier version of the Project. Desert Claim submitted a draft development agreement and revised drafts that included standards for wind turbines (location, number, size and setback) and other facilities; mitigation measures; and other development conditions to protect surrounding properties, communities, and the County as a whole. Desert Claim believes that the original project proposal was consistent with Kittitas County's Zoning Code and Comprehensive Plan, but the Board of County Commissioners denied its application.

Kittitas County Critical Areas Ordinance (Title 17A)

Kittitas County's Critical Areas Ordinance (CAO, KCC 17A.03.045) sets forth the requirements for protecting frequently flooded areas, aquifer recharge areas, wetlands, fish and wildlife habitat conservation areas, and geologically hazardous areas.

- ***Wetlands***: Kittitas County has adopted a 'zero net loss' wetlands policy. "Zero" or "no" net loss does not mean that no impacts to wetlands can occur. Rather, it means that wetland impacts must be compensated for to ensure that no *net* reduction in wetland functions and values will occur; wetland subtractions may be offset by wetland additions, for example. As addressed in the Wetland and Stream report found at Tab 4, the Project has been designed to avoid impacts to wetlands.

- ***Fish and Wildlife Habitat Conservation Areas***: These areas include wetlands, big game winter range, riparian habitat and habitats for species of local importance (based on WDFW designations). Riparian areas are prioritized according to stream type, with buffers ranging from 10 to 200 feet from the ordinary high water mark. Terrestrial habitat is protected according to State and federal direction and local importance. The Applicant will review and if practical modify the location of turbines and other facilities (i.e., micro-siting) to avoid or minimize disturbance to shrub-steppe habitat and riparian communities. Disturbance to habitat will be mitigated according to the WDFW's Wind Power Guidelines.

- ***Agriculture***: Agricultural land is defined to include livestock raising, crop cultivation and harvesting, irrigation and drainage ditches, and farm roads. The County has adopted Growth Management Act minimum guidelines for classification and designation of agricultural lands, and has established an interim Commercial Agricultural Zone. Non-farm uses are discouraged in farm areas; incentives and support for farmers are a significant component of the designation. None of the Project Area is within the Commercial Agriculture Zone. Use of the area for wind energy facilities would not displace or interfere with existing agricultural uses.