

# Chapter 1

## SUMMARY

### 1.1 Introduction

Wind Ridge Power Partners, LLC (the Applicant) is proposing to build the Wild Horse Wind Power Project (WHWPP), a wind powered generation facility that would consist of up to 158 wind generation turbines and have an installed nameplate capacity of up to 312 megawatts (MW). The proposed project would be located along the ridge tops of Whiskey Dick Mountain, 2 miles north of Vantage Highway and 11 miles east of the City of Kittitas in Kittitas County, Washington. A map showing the project area location is presented in Figure 1-1. The project site has been selected primarily for its energetic wind resource and its access to existing high voltage transmission lines, which have adequate capacity to allow the wind generated power to be integrated into the power grid system.

The Applicant, in accordance with Chapter 463-42 Washington Administrative Code (WAC), filed an Application for Site Certification (ASC No. 2004-01) with the Washington State Energy Facility Site Evaluation Council (EFSEC) on March 9, 2004. The Applicant chose to obtain certification for the WHWPP according to the Revised Code of Washington (RCW) 80.50.060. EFSEC has jurisdiction over the evaluation of siting energy facilities such as the WHWPP. Upon completion of an environmental review, EFSEC will recommend approval or denial of the proposed wind facility to the governor of Washington.

EFSEC is evaluating the siting of the proposed WHWPP pursuant to the requirements of Chapter 80.50 RCW, and in accordance with the Washington State Environmental Policy Act (SEPA) (WAC 463-47) is conducting an environmental review with this Environmental Impact Statement (EIS). The information and resulting analysis presented in this Draft EIS are based primarily on information provided by the Applicant in the ASC No. 2004-01 (Wind Ridge Power Partners LLC 2004). Where additional information was used to evaluate the potential impacts associated with the proposed action, that information has been referenced. EFSEC's environmental consultant, Jones & Stokes, conducted an analysis of off-site alternatives during the preparation of this Draft EIS.

Chapter 1 provides a summary of the Draft EIS for the WHWPP. It briefly describes the Applicant's objective for the proposal, EFSEC's objective for review of the proposal, the Applicant's proposal, and the alternatives to the proposal that are evaluated in this EIS. Chapter 2 provides a more detailed description of the proposed action, and no action and off-site alternatives. Chapter 3 documents the affected environment, evaluates the proposed action and the alternatives, and provides mitigation measures for adverse impacts associated with the proposed action. Potential cumulative impacts of future wind generation facility development within Kittitas County are also presented. The remaining chapters provide supporting information for the DEIS, as required by SEPA.

## **1.2 Purpose of and Need for Project**

The purpose of the WHWPP is to construct and operate a new electrical generation resource using wind energy that would meet a portion of the projected growing regional demands for electricity. In the Pacific Northwest Electric Power Planning and Conservation Act, Congress established that development of renewable resources should be encouraged in the Pacific Northwest (16 USC § 839[1][B]). The Act defines wind power as a renewable resource (§ 839a[16]).

The project is designed to provide low cost renewable electric energy to meet the growing needs of the Northwest. The project has transmission and interconnection requests under review with the Bonneville Power Administration (BPA) and Puget Sound Energy (PSE). The Applicant is in the process of marketing the electricity that would be produced by the WHWPP to local and regional utilities and power marketers.

### **1.2.1 Need for Additional Power Generation Facilities**

Recent national and regional forecasts predict increasing consumption of electrical energy would continue into the foreseeable future, requiring development of new generation resources to satisfy the increasing demand. The Energy Information Administration published a national forecast of electrical power through the year 2025. In it, the administration projected that total electricity demand would grow between 1.8 and 1.9% per year from 2001 through 2025. Rapid growth in electricity use for computers, office equipment, and a variety of electrical appliances in the residential and commercial sectors is only partially offset by improved efficiency in these electrical applications (U.S. Energy Information Administration 2003).

The Western Electricity Coordinating Council (WECC) forecasts electricity demand in the western United States. According to WECC's most recent coordination plan, the 2001-2011 summer peak demand requirement is predicted to increase at a compound rate of 2.5% per year (WECC 2002).

Based on data published by the Northwest Power and Conservation Council (NWPCC), electricity demand for the Council's four-state Pacific Northwest planning region (Washington, Oregon, Idaho, and Montana) was 20,080 average MW in 2000 (NWPCC 2003).

As shown in Table 1-1, the Council's recently revised 20-year demand forecast projects that electricity demand in the region will grow from 20,080 average MW in 2000 to 25,423 average MW by 2025 (medium forecast), an average annual growth rate of just less than 1% per year. While the Council's forecast indicates that the most likely range of demand growth (between the medium-low and medium-high forecasts) is between 0.4 and 1.50% per year, the low to high forecast range used by the Council recognizes that growth as low as -0.5% per year or as high as 2.4% per year is possible, although relatively unlikely (NWPCC 2003).

**Table 1-1. Projected Pacific Northwest Electricity Demand, 2000–2025**

Forecast Scenario	Electricity Demand (Average Megawatts)			Growth Rates (% Change)	
	2000	2015	2025	2000–2015	2000–2025
Low	20,080	17,489	17,822	-0.92	-0.48
Medium Low	20,080	19,942	21,934	-0.05	0.35
Medium	20,080	22,105	25,423	0.64	0.95
Medium High	20,080	24,200	29,138	1.25	1.50
High	20,080	27,687	35,897	2.16	2.35

Source: NWPCC 2003

Generated power typically requires interconnection with a high-voltage electrical transmission system for delivery to purchasing retail utilities. The Applicant has submitted requests for transmission interconnection services for the project to both Puget Sound Energy (PSE) and Bonneville Power Administration (BPA). The project would connect to either or both of the PSE or BPA transmission systems that run in close proximity to the project site along of the following lines:

- Puget Sound Energy’s Intermountain Power 115kV line, portions of which will be upgraded to 230 kV and intertie to Mid-C;
- Bonneville’s Grand Coulee to Olympia 287-kV line; and
- Bonneville’s Columbia to Covington 230-kV line.

In summary, electrical consumers in the Northwest need increased power production to serve the predicted long-term increasing demand and high-voltage transmission lines to deliver the power.

### 1.2.2 Wind Power Project Purpose and Need

Washington and the Northwest region face a growing medium and long-term demand for power. Many regional utilities are currently seeking to acquire new generating resources to meet their loads. More specifically, several regional utilities, including Avista, PSE, and PacifiCorp (doing business as Pacific Power in Washington) have all completed detailed studies and demand forecasts of their own systems as part of their Integrated Resource Plans (IRP) or Least Cost Plans (LCP) process with oversight from the Washington Utilities and Transportation Commission (WUTC). As a result of their formal IRP or LCP processes, PSE, PacifiCorp and Avista have issued requests for proposals (RFPs) specifically for wind power and/or other renewable resources. Avista is seeking to acquire 50 MW, PSE is seeking to acquire a minimum of 150 MW, and PacifiCorp is seeking to acquire 500 MW. Thus the regional demand for wind-generated energy exceeds the existing regional supply.

The proposed WHWPP would help meet this growing regional demand for renewable, wind-generated electricity.

### **1.2.3 Transmission Feeder Line Purpose and Need**

In order to deliver the energy generated by the project to customers, the project must be interconnected with the high voltage transmission grid. The nearest existing transmission lines of the appropriate voltage for interconnecting a project of this size are the PSE 115kV Intermountain Power line to the south of the project site and the BPA Schultz to Vantage 500 kV line west of the project site. In order to interconnect with these existing transmission lines, it is necessary to construct new feeder lines between the project site and these existing lines.

## **1.3 Decisions to Be Made**

EFSEC has sole jurisdiction over the evaluation and licensing steps for siting certain major energy facilities in the state of Washington. Through its review EFSEC coordinates the comments and interests of state agencies that participate in the EFSEC review process. EFSEC will issue the Final EIS and will make a recommendation to the governor to approve or deny the WHWPP. If the Governor of Washington State approves the siting of the WHWPP, EFSEC will issue a Site Certification Agreement (SCA) that will specify the conditions of construction, operation, and decommissioning and will act as an “umbrella” authorization that incorporates the requirements of all state laws and regulations.

At the time of issuance of this Draft EIS, EFSEC has determined pursuant to WAC 463-28-030 that the WHWPP is not consistent with Kittitas County Land use Plans and Zoning Ordinances. [reference: EFSEC Council Order No. 791, Order on Consistency with Local and regional Land use Plans and Zoning Ordinances, June 8, 2004]. If the applicant requests state preemption according to WAC 463-28-020, EFSEC would also make a recommendation to the Governor of Washington State whether the state should preempt local land use plans or zoning ordinances for this proposal.

EFSEC’s jurisdiction would extend over the WHPPP, associated feeder lines, and other facilities owned and operated by Wind Ridge Power Partners. The WHWPP viability does not depend on interconnection with the BPA transmission system and can be achieved through the PSE system. If the Applicant formally requests interconnection to the BPA transmission system, BPA would be responsible for permitting, constructing, owning, and operating a new interconnection substation near its existing Schultz substation, as well as a new feeder line extension between the point of interconnection and the point of delivery. The environmental impacts of the BPA action would be reviewed in a separate process pursuant to the requirements of the National Environmental Policy Act (NEPA) (BPA 2003, Appendix A).

## **1.4 Description of Alternatives**

Six alternatives are evaluated in this EIS. Alternatives include the Proposed Action Alternative, (constructing and operating the WHWPP and associated components), four off-site alternative locations (Kittitas Valley, Desert Claim, Springwood Ranch, and Swauk Valley Alternatives), and the No Action Alternative (not constructing and operating the proposed action). In addition, three design scenarios are considered as part of the Proposed Action Alternative. These alternatives are described below.

### 1.4.1 Proposed Action

The proposed project is to construct and operate a wind power project located on high open ridge tops between the towns of Kittitas and Vantage at a site located above the Kittitas Valley. The project would include wind turbine generators (WTGs) that would be constructed in rows along the open ridge tops of Whiskey Dick Mountain. The size and number of wind turbines to be used for the project depends on a number of factors, including wind turbine economics and availability at the time of construction. The resulting nameplate capacity of the project would depend on the final model and nameplate rating of turbine selected. Therefore, to evaluate a “reasonable range” of potential impacts associated with the WHWPP, this EIS evaluates the potential impacts of the proposed action on the natural and built environment under three project scenarios:

- 104-turbine/3 MW scenario: This scenario represents the project configuration with the fewest proposed turbines with the largest WTG. For turbines with a nameplate capacity of 3 MW each, up to 104 turbines would be sited for a total nameplate capacity of 312 MW.
- 136-turbine/1.5 MW scenario: This scenario represents the “most likely” project configuration that would be chosen based on pricing and performance for wind turbine technology currently on the market. For turbines with a nameplate capacity of 1.5 MW each, 136 turbines would be sited for a total nameplate capacity of 204 MW.
- 158-turbine/1 MW scenario: This scenario represents the project configuration with the most proposed turbines with the smallest WTG. For turbines with a nameplate capacity of 1 MW each, up to 158 turbines would be sited for a total nameplate capacity of 158 MW.

The wind generation facility would consist of several prime elements that would be constructed in consecutive phases. A site layout illustrating these key elements is shown in Figure 1-2. A permanent footprint of approximately 165 acres would be required to accommodate the proposed turbines and related support facilities. The majority of the project footprint (turbine strings) would be sited along the ridge tops (Figure 1-3). The facilities, equipment, and features that would be installed as part of the proposed project include the following:

- Approximately 17 miles of new roads;
- Improvements to roughly 15 miles of existing roads;
- Approximately 27 miles of underground 34.5-kV collection system power lines;
- Approximately 2 miles of overhead 34.5-kV collection system power lines;
- Approximately 14 miles of overhead 230-kV transmission feeder lines;
- One or two step-up substations;
- One interconnection substation;
- Operations and maintenance (O&M) facility of approximately 5,000 square feet;
- Parking area for the O&M facility approximately 300 feet x 300 feet;
- Visitor’s kiosk; and
- Up to six permanent meteorological towers.

The project would be constructed across a land area of approximately 8,600 acres in Kittitas County in area currently zoned as Forest and Range and Commercial Agriculture. The majority of the WHWPP site and proposed interconnect points lie on privately owned land. Parts of the project site lie on land the Applicant has secured under a long term-lease with the Washington Department of Natural Resources (DNR). One portion of the proposed site is owned by the Washington Department of Fish and Wildlife (WDFW) that is currently under review by WDFW for possible lease to the Applicant. The Applicant has obtained wind option agreements with landowners for all private lands within the project site boundary and transmission feeder line corridors.

### **1.4.2 Alternatives Considered But Rejected**

Consideration was given to alternative power generation technology and alternative wind turbine design. Several types of wind energy conversion technologies have been developed over the past three decades and include 1) vertical axis Darrieus wind turbines, 2) two-bladed downwind wind turbines, 3) smaller three-bladed upwind wind turbines (500 to 750 kilowatt [kW]), and 4) larger 3-bladed upwind wind turbines (1 to 3 MW). The three-bladed, upwind, horizontal axis is currently the preferred technology, based on proven reliability and commercial viability. Details of the consideration of other technologies and the reasons for eliminating them from further consideration are discussed in Section 2.5, “Alternatives Considered but Eliminated from Detailed Study.”

The Applicant utilized a number of key criteria to design the proposed project layout. The proposed layout was defined during the project development phase based on the results of Applicant-commissioned surveys and studies. The project infrastructure was sited to avoid all documented locations of sensitive environmental resources. Details of the consideration of other project layouts and the development of the layout of the proposed action are discussed in Section 2.5.2, “Consideration of Alternative Project Layouts.”

### **1.4.3 Off-Site Alternatives**

Consideration was given to other possible sites available for wind power generation within Kittitas County. Consistent with the SEPA Rules, specifically WAC 197-11-440 (5) and in response to scoping comments suggesting the viability of other sites for wind power project development, EFSEC conducted an independent evaluation (Jones & Stokes 2004) for off-site alternative locations within Kittitas County. The off-site alternatives analysis was conducted at a “non-project” level, consistent with WAC 197-11-442, at a level of detail sufficient to evaluate their comparative merits. The affected environment and impact analysis for each element of the environment evaluated for the off-site alternatives has been incorporated into this Draft EIS under the corresponding environmental resource. Detailed discussion of the screening and selection process of the off-site alternatives to be carried forward in this EIS is presented in Chapter 2.

### **1.4.4 No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated, and the environmental impacts described in this EIS would not occur. The No Action Alternative

assumes that future development would comply with existing zoning requirements for the project area, which is zoned Commercial Agriculture and Forest and Range. Permitted uses in the Commercial Agriculture zone include residential uses, greenhouses, and agricultural practices. Permitted uses in the Forest and Range zone include logging, mining, quarrying, and agricultural practices, as well as residential uses (Kittitas County 1991). If the proposed project is not constructed, it is likely that the region's need for power would be addressed by some combination of user-end energy efficiency and conservation measures, by existing power generation sources, or by the development of new renewable and non-renewable generation sources. Base load demand would likely be filled through the expansion of existing, or development of new, thermal generation such as gas-fired combustion turbine technology. Such development could occur at conducive locations throughout the state of Washington.

A base load natural gas-fired combustion turbine would have to generate 67 average MW of energy to replace an equivalent amount of power generated by the project (204 MW at 33% net capacity). (An average MW or "aMW" is the average amount of energy supplied over a specified period of time, in contrast to "MW," which indicates the maximum or peak output [capacity] that can be supplied for a short period.)

## **1.5 Summary of Public Involvement, Consultation, and Coordination**

The Applicant has been communicating and meeting with agencies, Indian Tribes, the public, and non-governmental organizations throughout the development of the proposed project and will continue through the EIS process. Local, state, and federal agencies and tribal representatives the Applicant has consulted with including the following:

- Local Agencies: Kittitas County Planning Staff, Kittitas County Public Works Department, Ellensburg Fire District #2, Kittitas School District
- State Agencies: WDFW: Regional Staff and Managers, DNR, WSDOT, Office of Archeology and Historic Preservation
- Federal Agencies: BPA, USFWS, FAA
- Tribal Governments: Yakama Nation, Confederated Tribes of the Colville Reservation, Wanapum Tribe, and Spokane Tribe.

Details and dates of meetings and correspondence are contained in Section 2.11, "Coordination and Consultation with Agencies and Indian Tribes."

EFSEC conducted public informational and EIS scoping meetings, whereby agencies and the public were invited to comment on the scope of the EIS. Two meetings, one for the agencies and a second for the general public, were held on April 22, 2004 at the Ellensburg County Fairgrounds to provide information on the project and to receive comments on the scope of the EIS. Public notices were mailed to local and regional newspapers, and press releases were issued to local and regional radio stations and newspapers. EFSEC also held a land use consistency hearing on the proposed project in Ellensburg on April 22, 2004.

EFSEC has contracted with the Washington Department of Fish and Wildlife (WDFW) and the Department of Ecology (Ecology) to review and provide input regarding the Applicant's

proposal. The WDFW was consulted to identify agency issues and concerns regarding the potential project impacts on vegetation, wetlands, wildlife, fisheries, and threatened and endangered species with the potential to occur in the project area, as well as to solicit guidance on project mitigation measures. Ecology was consulted to solicit their input regarding potential project impacts on wetlands, water resources and water quality, and air quality.

Project documents are available to the public on the EFSEC website and in local libraries. Further opportunities for public involvement will occur throughout the SEPA process. A public comment hearing for the Draft EIS will be scheduled during the 30-day comment period, and additional public comment will be received by EFSEC through adjudicative hearings to be held before the Final EIS is issued.

## **1.6 Summary of Potential Impacts and Mitigation Measures**

### **1.6.1 Introduction**

Potential environmental impacts from the WHWPP and the Alternatives are described in Chapter 3 of this Draft EIS. The proposed project has been designed to minimize impacts on the natural and built environment. Table 1-3 provides a summary of mitigations inherent to the project design, including studies conducted to avoid potential impacts, project design features, construction practices and operations practices.

In addition to the mitigation measures presented in Table 1-3, the Applicant has proposed to mitigate for all permanent and temporary impacts on habitat caused by the project in accordance with the ratios outlined in the WDFW Wind Power Guidelines (WDFW, August 2003).

A mitigation parcel has been identified within the 8,600-acre project area. The mitigation parcel is T18N, R21E, Section 27, except for a portion of this section that would be developed as part of the project. String "L" follows a ridgeline that bisects Section 27 from north to south. The area set aside for project mitigation is estimated at approximately 600 acres, which is more than the required replacement habitat under the WDFW Wind Power Guidelines. The Applicant has agreed to fence this parcel to eliminate livestock grazing, assuming the land ownership and grazing practices of adjacent properties at the time the project goes into operation would require fencing to remove livestock from this parcel.

The Applicant is proposing to fence several springs within the project area to eliminate livestock degradation in addition to Section 27. Fencing used for the mitigation parcel and the springs would be designed to keep livestock out but allow game species to cross. The Applicant intends to coordinate with Washington Department of Fish and Wildlife (WDFW) regarding fence specifications.

The WDFW Wind Power Guidelines were followed during the selection of Section 27 as a mitigation site for the project. Section 27 provides opportunity for "like-kind" replacement habitat of equal or higher habitat value than the impacted area and it occurs in the same geographical region as the impacted habitat. Furthermore, since the Applicant has an option to purchase the property if the project goes forward, the Applicant can provide legal protection and protection from degradation for the life of the project. Consistent with WDFW's guidelines, permanent impacts on habitat would be replaced at a ratio equal to or greater than 1:1 for grassland and 2:1 for shrub-steppe.

Additional benefits of Section 27 as a mitigation parcel for the project include:

- Protection of a segment of Whiskey Dick Creek;
- Continuity of habitat with adjacent state lands; and
- Preservation of a diversity of habitats.

Use of Section 27 as a mitigation parcel would result in protection of an approximately 1-mile segment of Whiskey Dick Creek near its headwaters. Protection of waterways and their adjacent riparian habitat provide significant benefits above and beyond replacement of “like-kind” habitat at agreed upon ratios. Protection of this segment of Whiskey Dick Creek provides benefits for water quality, wildlife, and species diversity. In addition, Section 27 is adjacent to state-owned lands. WDNR administers Section 34 to the south and WDFW administers Section 26 to the east. Use of Section 27 for mitigation would provide continuity of habitat with these adjacent state-owned sections. Finally, a variety of habitat types that occur in the general project area are found in Section 27, so a diversity of habitat types would be preserved. These include shrub-steppe (moderate and dense), herbaceous, herbaceous/rock outcrop, and woody riparian.

**Table 1-2.** Summary of Potential Impacts of Proposed Action (Including Transmission Feeder Lines[s]) and No Action Alternative

<b>3.1 EARTH RESOURCES</b>				
<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b>Construction Impacts</b>				<b>Mitigation Measures Proposed by Applicant</b>
Changes to local topography/area of temporary ground disturbance	289 total acres disturbance	356 total acres disturbance	401 total acres disturbance	<b>Erosion Control during Construction</b>  Before construction begins, a detailed Stormwater Pollution Prevention Plan (SWPPP) would be developed and approved by EFSEC for the project to reduce the potential for erosion and pollutant discharge from the site during construction and operation activities. The SWPPP would meet the requirements of Ecology’s General Permit to Discharge Storm Water and General sand and gravel permit, and the requirements of a National Pollution Discharge Elimination System (NPDES) Stormwater Construction Permit.
Cut-and-fill requirements	326,693 cubic yards	328,866 cubic yards	326,891 cubic yards	
Import sand and gravel fill requirements	52,575 cubic yards	53,686 cubic yards	51,875 cubic yards	
Off-site excavation spoils disposal	0 cubic yards	0 cubic yards	0 cubic yards	
<b>Operation and Maintenance Impacts</b>				The SWPPP would include both structural and non-structural BMPs. Structural BMPs include installation of silt fences and other physical controls to divert flows from exposed soils or to limit runoff and pollutants from exposed portions of the site. Nonstructural BMPs include materials handling protocols, disposal requirements, and spill prevention methods.
Erosion potential/area of permanent ground disturbance	165 acres	165 acres	165 acres	
Earthquake hazard	Low	Low	Low	
Volcanic hazard	Low	Low	Low	The SWPPP would be prepared along with a detailed project grading plan by the Engineering, Procurement, and Construction (EPC) contractor when design-phase topographic surveying and mapping are completed for the site.
Landslide hazard	Low	Low	Low	
<b>Decommissioning Impacts</b>				
	Same as most likely scenario.	Similar to, but less than, construction impacts. Extent depends on fate of access roads.	Same as most likely scenario.	
		Decommissioning would consist of removing above-ground facilities and their associated foundations to a depth of 3 feet below the		

Table 1-2 continued.

surface level. Overhead power lines and associated structures would be removed if not utilized by the applicable utility (PSE or BPA). The substations could convert to Utility ownership. Underground facilities would be left in place subject to landowner approval. Removal of the O&M facility would be coordinated with the applicable landowner.

BMPs would be site-specific for slopes, construction activities, weather conditions, and vegetative buffers. Clearing, excavation, and grading would be limited to the smallest areas necessary to construct the project.

All construction practices would emphasize erosion control through such measures as using straw mulch, erosion control blankets, vegetating disturbed surfaces, retaining original vegetation wherever possible, directing surface water runoff away from denuded areas, keeping runoff velocities low by minimizing slope steepness and length, and providing and maintaining stabilized construction entrances.

Reclamation procedures would be in accordance with site-specific requirements and techniques commonly used at the time of decommissioning, including regrading, adding topsoil, and revegetating all disturbed areas.

Erosion control measures to be implemented for access road development include maintaining vegetative buffer strips between the affected areas and any nearby receiving waterways; installing sediment fence/straw bale barriers on disturbed slopes and other locations shown in the SWPPP; using straw mulch at locations adjacent to an affected road; providing temporary sediment traps and synthetic mats downstream of seasonal stream crossings; installing silt fences on steep, exposed slopes; and planting affected areas with designated seed mixes.

During construction, silt fences, hay bales, or matting would be placed on the down-slope side of crane pads.

Table 1-2 continued.

Design specifications and further details for excavation, blasting, and other activities associated with the removal and preparation of quarry materials for project construction will be included in the project plans and specifications. This information and a reclamation plan for the rock quarries will be provided to EFSEC for review and approval prior to start of construction.

**Erosion Control during Operation and Maintenance**

Operational BMPs would be adopted, as part of the SWPPP, to prevent stormwater pollution by implementing good housekeeping, preventative, and corrective maintenance procedures; steps for spill prevention and emergency cleanup; employee training programs; and inspection and record-keeping practices as necessary. Operational BMPs would include prompt cleanup and removal of spillage, regular pickup and disposal of garbage, regular sweeping of floors in the O&M, HAZMAT data sheet cataloging and recording, and proper storage of containers.

**Earthquakes**

Project facilities would be designed in accordance with current engineering standards, either the Uniform Building code (UBC) or the International Building Code (IBC) requirements and those of Kittitas County (the 1997 UBC).

A detailed geotechnical evaluation and field survey would be completed to ensure turbine locations and other project elements would not lie immediately above a high-risk fault.

The wind turbines would be equipped with vibration sensors that would automatically shut down the turbine in the event of a severe earthquake.

Table 1-2 continued.

The Applicant would prepare detailed emergency plans to protect the public health and safety and environment on and off the project site to mitigate for potential hazards during an earthquake.

**Volcanic Hazards**

In the event of damage or potential impact from a volcanic eruption, the project facilities would be shut down until safe operating conditions return. On-site emergency plans would be prepared to protect human health, safety, and the environment.

**Landslides**

No project facilities would be constructed on unstable slopes or landslide-susceptible terrain. Prior to project construction, additional geotechnical explorations, including drilling and ground-penetrating radar surveys, would be completed as necessary to delineate the limits of the landslide area to establish sufficient setback distances for project facilities.

**Unique Features**

Should unique physical or unique geological features such as petrified ginkgo deposits be discovered at the site during construction, work would be halted and the project manager would immediately contact appropriate personnel at EFSEC and the Washington State Historic Preservation Office to coordinate an appropriate response.

**Contaminated Soils**

In the unlikely event that contaminated soils are encountered, the Applicant would notify EFSEC and appropriate personnel with the Washington State Department of Ecology. Contaminated soils would be handled and disposed of according to state and local requirements.

Table 1-2 continued.

**Decommissioning Plans**

Both an Initial and Final Site Restoration Plan would be prepared and approved by EFSEC for the project. Reclamation procedures would be based on site-specific requirements and techniques commonly employed at the time the area is to be reclaimed, and would include regrading, adding topsoil, and reseeded all disturbed areas.

**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated and the impacts described above would not occur. Development by others could occur at the project site in accordance with Kittitas County’s existing Comprehensive Plan and zoning regulations. The project site is currently zoned Commercial Agriculture and Forest and Range. Depending on the location, type, and extent of future development at the project site, impacts on earth resources could be similar to or even greater than the proposed action. If long-term energy needs are to be met, development of new renewable and non-renewable generation sources might be required. It is estimated that a base load combustion turbine facility generating 60 average megawatts (aMW) of power could require approximately 14 acres for the plant site. Renewable generation sources might require substantially greater land area for a facility site.

Construction of a base load gas-fired combustion turbine projects may also result in greater disturbance of earth resources compared to the WHWPP because of the possible need to establish a gas pipeline to the facility and electrical transmission interconnections. The specific type, nature, and extent of earth resource impacts under the No Action Alternative, such as erosion and risk of earthquakes and volcanic eruption, would depend on the site-specific location of the energy plant and its associated facilities.

**3.2 AIR QUALITY**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b>Construction Impacts</b>				<b>Mitigation Measures Proposed by Applicant</b>
Odors	Limited and negligible	Limited and negligible	Limited and negligible	<ul style="list-style-type: none"> <li>▪ All vehicles used during construction will comply with applicable federal and state air quality regulations for tailpipe emissions.</li> <li>▪ Operational measures such as limiting engine idling time and shutting down equipment when not in use will be implemented.</li> <li>▪ Active dust suppression will be implemented on unpaved construction access roads, parking areas and staging areas, possibly using water-based dust suppression materials in compliance with state and local regulations.</li> <li>▪ Housekeeping measures around batch plant and rock crushing facilities to prevent</li> </ul>
Impacts during construction of substations and transmission facilities	Similar to most likely Scenario	Temporary, localized impacts caused by fugitive dust during construction	Similar to most likely Scenario	
Fugitive dust and exhaust emissions	Similar to most likely Scenario	Negligible impact caused by fugitive dust and tailpipe emissions from commute vehicles and onsite operational vehicles.	Similar to most likely Scenario	
<b>Operation and Maintenance Impacts</b>				
Odors	None	None	None	

Table 1-2 continued.

<p>Regulated air pollutants</p>	<p>Same as most likely scenario.</p>	<p>No impact; net benefit provided by avoidance of regulated criteria pollutants that would otherwise be generated by fossil fuel power plants</p>	<p>Same as most likely scenario.</p>	<p>buildup of fine materials.</p> <ul style="list-style-type: none"> <li>▪ Traffic speeds on unpaved access roads will be kept to 25 mph to minimize generation of dust.</li> <li>▪ Carpooling among construction workers will be encouraged to minimize construction-related traffic and associated emissions.</li> <li>▪ Disturbed areas will be replanted or graveled to reduce wind-blown dust.</li> <li>▪ Erosion control measures will be implemented to limit deposition of silt to roadways.</li> </ul>
<p>Greenhouse gas emissions</p>	<p>Same as most likely scenario.</p>	<p>No impact, net benefit provided by avoidance of greenhouse gas emissions from other sources of power generation that would have otherwise been built or operated to produce an equivalent amount of energy</p>	<p>Same as most likely scenario.</p>	<p>In addition to the above mitigation measures, construction would cease during periods of high wind strong enough to generate visible dust plumes from process equipment and unpaved roads.</p> <p>The air quality permit for the temporary rock crusher and the temporary concrete batch plant will require the use of emission control devices to reduce dust generated by these processes. Water sprays will be used on the rock crusher and the concrete batch plant dry loading operations, and a fabric filter will be used for the Portland cement silo.</p> <p>No air quality mitigation is proposed for project operations as there would be no air or odor emissions generated by stationary sources. Dust abatement measures implemented during operation would be continued as appropriate.</p>
<p><b><i>Decommissioning Impacts</i></b></p>	<p>Same as most likely scenario</p>	<p>Decommissioning operations would generate fugitive dust and tailpipe emissions similar to those generated during construction. Impacts would likely be less since access roads may be left in place.</p>	<p>Same as most likely scenario</p>	

Table 1-2 continued.

**No Action Alternative**

The No Action Alternative assumes that future development at the site would comply with existing zoning requirements for the project area, which is zoned Commercial Agriculture and Forest and Range. According to the County’s zoning code, the Commercial Agriculture zone is dominated by farming, ranching, and rural lifestyles; permitted uses include residential, greenhouses and agricultural practices. The specific type, nature, and extent of future developments at the project site are unknown, and would depend primarily on county growth trends.

If the proposed project were not built, additional renewable and non-renewable energy facilities may have to be constructed. Construction related emission would be commensurate with the land area being disturbed by such projects. If the proposed project were not built, a base-load natural gas-fired turbine facility generating 67 aMW might replace the power that would have been produced by the proposed project. The estimated annual emissions from a hypothetical 67 aMW power plant would be as follows: 22 tons of nitrogen dioxide, 20 tons of CO, and 220,000 tons of carbon dioxide (greenhouse gas emissions).

Impacts related to decommission of such facilities would depend on the structures to be removed, and the land area being disturbed by decommissioning of such projects.

**3.3 WATER RESOURCES**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
				<b>Mitigation Measures Proposed by Applicant</b>
<b>Construction Impacts</b>				
Surface runoff from ground disturbance and exposed soils	289 acres	356 acres	401 acres	The proposed design of the project incorporates numerous features to avoid and/or minimize impacts on water resources and includes minimizing new road construction by improving and using existing roads and trails; not developing wells on site, using only off-site sources of water for construction and operation; and locating roads, underground cables, turbine foundations, transmission poles and other associated infrastructure outside any surface water or other sensitive resources, avoiding drainage crossings to the maximum extent feasible; complying with federal, state, and local ordinances; and implementing a formal SWPPP and BMPs during construction.
Water consumption	10,500,000 gallons	10,700,000 gallons	10,800,000 gallons	
Encountering groundwater during turbine foundation construction	Excavation depth of 22 ft. (for spread footing foundations) to 35 ft. (for mono-pier foundations) (104 turbines)	Excavation depth of 18 ft. (for spread footing foundations) to 35 ft. (for mono-pier foundations) (136 turbines)	Excavation depth of 14 ft. (for spread footing foundations) to 35 ft. (for mono-pier foundations) (158 turbines)	
				The detailed SWPPP as required by the NPDES Industrial Stormwater General Permit, will be developed and implemented to minimize the potential for discharge of pollutants from the site to surface waters during construction and operation and maintenance activities. See Section 3.1 Earth Resources for more details on the proposed SWPPP and its implementation.
<b>Operation and Maintenance Impacts</b>				
Erosion potential/area of permanent ground disturbance	165 acres	165 acres	165 acres	
Water consumption	<1,000 gallons daily at O&M facility	<1,000 gallons daily at O&M facility	<1,000 gallons daily at O&M facility	
<b>Decommissioning Impacts</b>				
	Similar to construction	Similar to construction (e.g. soil disturbance, stormwater).  Surface water runoff potential would be greatest during the dismantling of the project, when soil is disturbed by	Similar to construction	

Table 1-2 continued.

vehicular activity and removal of facilities. Dismantling the project would require water for dust control. Sediment and erosion control practices would minimize or eliminate potential impacts on surface waters and groundwater.

During decommissioning, mitigation of potential impacts would follow the same procedures in use during construction (i.e., BMPs, SWPPP).

**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated. However, development by others, and of a different nature, including residential development, could occur at the project site in accordance with Kittitas County’s existing Comprehensive Plan and zoning regulations. Depending on the location, type, and extent of future developments at the project site, impacts on water resources could be similar to or even greater than the proposed action.

If the proposed project were not constructed, the region’s base load power needs could be delivered through development of other generation facilities, most likely a gas-fired combustion turbine. Gas-fired combustion turbine projects could expose more soil to potential erosion because of the possible need to establish a gas pipeline to the facility and electrical transmission interconnections. Also, substantial amounts of water, estimated at 200 acre-feet (65 million gallons) per year, would be needed for cooling water during plant operation. Operation of a water-cooled combustion turbine facility would also result in discharge of large volumes of wastewater.

Development of other wind energy projects would result in impacts similar to those of the Proposed Action.

**3.4 VEGETATION AND WETLANDS**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b>Construction Impacts</b>				<b>Mitigation Measures Proposed by Applicant</b>
Temporary vegetation removal and habitat loss	289.5 acres disturbed area	356.0 acres disturbed area	401.4 acres disturbed area	The Applicant has proposed a comprehensive mitigation package for potential impacts to vegetation resources at the project site in accordance with WDFW guidelines for siting Wind Energy facilities in Eastern Washington. Thorough surveys, inventories, and analysis were conducted to identify vegetation resources at the site. Mitigation consists of project design features, construction techniques, and BMPs to avoid and minimize impacts; post-construction restoration of temporarily disturbed areas; and operational BMPs to minimize impacts.
Permanent vegetation removal and habitat loss	164.7 acres disturbed area	164.7 acres disturbed area	164.6 acres disturbed area	
Permanent impacts on lithosols	61 acres disturbed	61 acres disturbed	61 acres disturbed	
Impacts on wetlands	None	None	None	
Impacts on federal or state listed endangered, threatened, proposed for listing, or species of concern plant species	None	None	None	
Impacts on state “Review” plant species	Same as most likely scenario.	Removal of individuals where located within project facility footprint and temporary construction perimeters	Same as most likely scenario.	

**Table 1-2 continued.**

**Operation and Maintenance Impacts**

Wind turbine shading vegetation	Negligible	Negligible	Negligible
Dust generation	Negligible	Negligible	Negligible
Potential project area colonization by invasive species	289.5 acres disturbed area	356.0 acres disturbed area	401.4 acres disturbed area
Impacts on wetlands	None	None	None
Impacts on federal or state listed endangered, threatened, proposed for listing, or species of concern plant species	None	None	None
Impacts on state “Review” plant species	Negligible	Negligible	Negligible

**Decommissioning Impacts**

Vegetation impacts	Similar to most likely scenario..	Dismantling impacts would be similar to but likely less than impacts described for construction, if access roads remain in place. Vehicles would generate dust and potentially introduce or spread weedy or noxious plant species. Vegetation surrounding project facilities to be removed would likely be affected to the same extent as identified for construction. Reclamation procedures would be based on currently used techniques and would include regrading, adding topsoil, and revegetating disturbed areas with native plant species.	Similar to most likely scenario..
Wetlands	None	None	None

**Shrub-Steppe Habitat**

The Applicant proposes to mitigate for all temporary and permanent impacts to vegetation, specifically the protection and enhancement of over 600 acres of on-site shrub-steppe and riparian habitat in Section 27. This mitigation parcel would be fenced to allow game species to cross while preventing degradation by livestock.

**Noxious Weed Control**

- The contractor will clean construction vehicles prior to bringing them in to the project area from outside areas.
- Disturbed areas will be reseeded as quickly as possible with native species.
- Seed mixes will be selected in consultation with WDFW and Kittitas County Weed Control Board.
- If hay is used for sediment control or other purposes, hay bales will be certified weed free.
- Access to the site will be controlled which may result in a lower level of disturbance and fewer opportunities for noxious weeds to be introduced and/or spread.
- Noxious weeds that may establish themselves as a result of the project will be actively controlled in consultation with the Kittitas County Weed Control Board.

Table 1-2 continued.

**Special-Status Plants**

Access to the site will be controlled during both construction and operations to minimize potential impacts to hedgehog cactus, a Washington State Review listed species. If collection becomes a problem at the project site despite controlled access, the Applicant proposes to post signage indicating that collection of any plants in the project area is prohibited.

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**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated. However, development of a different nature could occur under Kittitas County’s existing Comprehensive Plan and zoning regulations for the project area. Depending on the location, type, and magnitude of future developments at the project site, impacts on vegetation, wetlands, or to threatened or endangered plant species could be similar to or even greater than the proposed action.

Other power generation facilities could be constructed and operated in the region to meet the long-term need for power. Constructing a base load gas-fired turbine generator, developing and extracting natural gas, and constructing natural gas pipelines to provide fuel to the generating facility could create impacts on vegetation, wetlands, and threatened and endangered plant species. Construction of renewable energy facilities would also result in impacts to vegetation, wetlands, and threatened and endangered plant species. The significance of such impacts would depend on the site-specific location and design of the facility.

It is likely that cattle grazing would continue to be the primary agricultural activity in the vicinity of Whiskey Dick Mountain. Vegetation communities would continue to mature, however, wherever cattle grazing disturbed shrub-steppe and sensitive plant assemblages associated with lithosols and sensitive springs, wetlands, and riparian habitats, these plant communities would be vulnerable to nonnative and noxious weed establishment.

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**3.5 WILDLIFE**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b>Construction Impacts</b>				<b>Mitigation Measures Proposed by Applicant</b>  The Applicant has proposed a comprehensive mitigation package for potential impacts to animals and habitat for this project. It consists of thorough study and analysis to avoid impacts; project design features to minimize impacts; construction techniques and Best Management Practices (BMPs) to minimize impacts; post-construction restoration of temporarily disturbed areas; operational BMPs to minimize impacts; monitoring and adaptive management to minimize impacts during operations; and protection and enhancement of on-site habitat;
Temporary habitat loss	289 acres	356 acres	401 acres	
Permanent habitat loss	164.69 acres	164.74 acres	164.63 acres	
Impacts to bald eagle, golden eagle, and small mammals.	Same as most likely scenario.	Temporary disturbance	Same as most likely scenario.	
Disturbance to big game	Same as most likely scenario.	Possible avoidance behavior.	Same as most likely scenario.	
Impacts to peregrine falcon, burrowing owl, and amphibians	None	None	None	
<b>Operation and Maintenance Impacts</b>				

Table 1-2 continued.

Avian mortality: raptors and passerines.	Less than most likely scenario.	Raptors, 1–10/year Passerines, 50–300/year	More than most likely scenario.	protection and enhancement of on-site habitat; specifically providing protection for the life of the project for over 600 acres of shrub-steppe and riparian habitat in Section 27 and the fencing of springs in other areas of project to protect the springs from degradation by livestock.  Project design includes avoidance of construction in sensitive areas such as streams, riparian zones, wetlands, and forested areas; avoidance of locating wind turbines in prominent saddles along the main Whiskey Dick Ridge; minimization of new road construction by improving and using existing roads and trails instead of constructing new roads; choice of
Avian mortality: bald eagle, peregrine falcon and waterfowl	Same as most likely scenario.	Low probability of mortality.	Same as most likely scenario.	
Mortality: bats, small mammals, sage sparrow, and sage thrasher.	Same as most likely scenario.	Potential for mortality, number unknown.	Same as most likely scenario.	
Disturbance: sage grouse and other avian species.	Same as most likely scenario.	Potential for disturbance.	Same as most likely scenario.	
Disturbance: big game.	Same as most likely scenario.	Potential avoidance behavior.	Same as most likely scenario.	
Impacts to amphibians and burrowing owls.	None.	None.	None.	

Table 1-2 continued.

***Decommissioning Impacts***

Similar to most likely scenario

Decommissioning impacts would be less than those for construction as no access roads would be built and less heavy equipment use and ground disturbance would occur. The period of disturbance for dismantling would also be shorter than for construction. Vehicles would travel on established roadways, which would not impact habitat for special status species.

Dismantling the project would eliminate avian and bat mortality caused by the presence of wind turbines. Wildlife habitat would have the potential to return to preproject conditions over time, and disturbed areas would be reseeded with appropriate seed mixes to accelerate revegetation of these areas.

Similar to most likely scenario

instead of constructing new roads; choice of underground (vs. overhead) electrical collection lines wherever feasible to minimize perching locations and electrocution hazards to birds; choice of turbines with low RPM and use of tubular towers to minimize risk of bird collision with turbine blades and towers; use of bird flight diverters on guyed permanent meteorological towers or use of unguyed permanent meteorological towers to minimize potential for avian collisions with guy wires; Equipping all overhead power lines with raptor perch guards to minimize risks to raptors; and spacing of all overhead power line conductors to minimize potential for raptor electrocution.

Construction techniques include use of BMPs to minimize construction-related surface water runoff and soil erosion (these are described in detail in Section 3.3.2.1, “Water – Impacts of the Proposed Action – Construction – Surface Water Runoff/Absorption”); use of certified “weed free” straw bales during construction to avoid introduction of noxious or invasive weeds; flagging of any sensitive habitat areas (e.g., springs, raptor nests, wetlands) near proposed areas of construction activity and designation of such areas as “off limits” to all construction personnel; development and implementation of a fire control plan, in coordination with local fire

Table 1-2 continued.

districts, to minimize risk of accidental fire during construction and respond effectively to any fire that does occur; establishment and enforcement of reasonable driving speed limits (max 25 mph) during construction to minimize potential for road kills; proper storage and management of all wastes generated during construction; require construction personnel to avoid driving over or otherwise disturbing areas outside the designated construction areas; limiting construction activities during winter months to minimize impacts on wintering big game; designation of an environmental monitor during construction to monitor construction activities and ensure compliance with mitigation measures.

Operational BMPs would be similar to those implemented during construction and include a fire control plan, speed limit enforcement, storm water runoff and soil erosion; a noxious weed control program, in coordination with the Kittitas County Noxious Weed Control Board, identification and removal of all carcasses of livestock, big game, etc. from within the project that may attract foraging bald eagles or other raptors; control public access to the site to minimize disturbance impacts on wildlife, especially in the winter months; allow limited and controlled hunting on the site and allow WDFW access to the site to manage big game herds and minimize potential big game damage to nearby agricultural lands.

The Applicant proposes to develop a post-construction monitoring plan for the project to quantify impacts on avian species and to assess the adequacy of mitigation measures implemented. The Applicant plans to convene a Technical Advisory Committee to evaluate the mitigation and monitoring program and determine the need for further studies or mitigation measures.

Table 1-2 continued.

**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated. However, development of a different nature could occur under Kittitas County’s existing Comprehensive Plan and zoning regulations for the project area. Depending on the location, type, and magnitude of future developments at the project site, impacts on wildlife, or to threatened or endangered animal species could be similar to or even greater than the proposed action.

Other power generation facilities could be constructed and operated in the region to meet the long-term need for power. Constructing a base load gas-fired turbine generator, developing and extracting natural gas, and constructing natural gas pipelines to provide fuel to the generating facility could create impacts on wildlife, and threatened and endangered species. Construction of renewable energy facilities would also result in impacts to wildlife. The significance of such impacts would depend on the site-specific location and design of the facility.

**3.6 FISHERIES**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b>Construction Impacts</b>				<b>Mitigation Measures Proposed by Applicant</b>  Project design incorporates numerous features to avoid and/or minimize impacts on fisheries by avoiding impacts to streams and riparian areas. Measures include minimizing new road construction and roads, underground cables, turbine foundations, transmission poles, and other associated infrastructure will not be located within any riparian areas or streams or other sensitive resources.
Fish and fish habitat, stream and riparian areas	None	None	None	
Impacts on federal or state listed endangered, threatened, proposed for listing, or species of concern plant species	None	None	None	
Water quality and quantity	See Water Resources	See Water Resources	See Water Resources	
<b>Operation and Maintenance Impacts</b>				Most mitigation measures outlined in Section 3.3 Water Resources and 3.5 Wildlife Section also apply to fisheries. A formal SWPPP would be implemented and BMPs would be initiated to retain sediment from disturbed areas and minimize areas of disturbance. Proposed construction activities for the transmission feeder lines would not involve the use of any heavy equipment in streambeds or riparian areas.
Fish and fish habitat, stream and riparian areas	None	None	None	
Impacts on federal or state listed endangered, threatened, proposed for listing, or species of concern plant species	None	None	None	
Water quality and quantity	See Water Resources	See Water Resources	See Water Resources	Although no fisheries issues were identified in the project area, the Applicant proposes using construction techniques and BMPs to minimize potential impacts. These include using BMPs to minimize construction-related surface water runoff and soil erosion, flagging sensitive habitat areas (e.g., wetlands, seeps, and drainages) near proposed areas of construction activity and designating such areas as “off limits” to all
<b>Decommissioning Impacts</b>				
Fish habitat, stream and riparian areas	None	No impacts from decommissioning are anticipated due to the absence of potential fish habitat in the proposed project area.	None	

**Table 1-2 continued.**

Impacts on federal or state listed endangered, threatened, proposed for listing, or species of concern plant species	None	None	None	construction personnel, properly storing and managing all wastes generated during construction, requiring construction personnel to avoid driving over or otherwise disturbing areas outside the designated construction areas designating an environmental monitor during construction to monitor construction activities and ensuring compliance with mitigation measures.
Water quality and quantity	See Water Resources	See Water Resources	See Water Resources	
		Dismantling the project would reduce the quantity of impervious surfaces in the project area.		To minimize sediment delivery to streams, all temporarily disturbed areas would be reseeded with an appropriate mix of native plant species as soon as possible after construction to accelerate the revegetation of these areas. The Applicant would consult with WDFW regarding the appropriate seed mixes for the project area.

**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated. However, development of a different nature could occur under Kittitas County’s existing Comprehensive Plan and zoning regulations for the project area. Depending on the location, type, and magnitude of future developments at the project site, impacts on fish and fish habitat, threatened or endangered fish species could be similar to or even greater than the proposed action.

Other power generation facilities could be constructed and operated in the region to meet the long-term need for power. Constructing a base load gas-fired turbine generator, developing and extracting natural gas, and constructing natural gas pipelines to provide fuel to the generating facility could create impacts on fish and fish habitat, and threatened and endangered fish species. Construction of renewable energy facilities could also result in impacts on fish and fish habitat, and threatened and endangered fish species. The significance of such impacts would depend on the site-specific location and design of the facility.

**3.7 ENERGY AND NATURAL RESOURCES**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b>Construction Impacts</b>				<b>Mitigation Measures Proposed by Applicant</b>
Electricity Consumption	0 (Electricity provided by portable generators)	0 (Electricity provided by portable generators)	0 (Electricity provided by portable generators)	As the project would have a positive impact overall on the use of non-renewable resources, no mitigation is necessary or proposed.
Diesel Consumption	150,000 gal	150,000 gal	150,000 gal	During construction, conservation measures will include recycling of construction wastes where possible and encouraging carpooling among construction workers to reduce emissions and traffic.
Gasoline Consumption	30,000 gal	30,000 gal	30,000 gal	
Sand Use	37,200 cu yd	38,700 cu yd	39,000 cu yd	
Gravel Use (aggregate)	244,300 cu yd	246,600 cu yd	246,900 cu yd	

**Table 1-2 continued.**

Water Consumption	10,500,000 gal	10,700,000 gal	10,800,000 gal
Cement Use–Tower Foundations	31,000 cu yd	30,000 cu yd	36,000 cu yd
Steel Consumption–Turbine Towers	15,000 tons	12,000 tons	14,000 tons
Steel Consumption–Tower Foundations	2,100 tons	2,000 tons	2,500 tons
<b>Operation and Maintenance Impacts</b>			
Electricity Consumption	< 1% of total project output will be pulled from grid.	< 1% of total project output will be pulled from grid.	< 1% of total project output will be pulled from grid.
Fuel Consumption	11,500 gal	11,500 gal	11,500 gal
Water Consumption	<1,000 gal daily at O&M facility	<1,000 gal daily at O&M facility	<1,000 gal daily at O&M facility
Wind Turbine Generator Fluid Quantities:	55 gal (5,720 gal total)	40 gal (5,440 gal total)	30 gal (4,470 gal total)
Glycol-water mix	85 gal (5,893 gal total)	65 gal (5,893 gal total)	45 gal (4,470 gal total)
Hydraulic fluid	110 gal (11,440 gal total)	90 gal (12,240 gal total)	70 gal (11,060 gal total)
Lubricating oil			
Substation Transformer Mineral Oil	500 gal per transformer (68,000 gal total)	500 gal per transformer (68,000 gal total)	500 gal per transformer (68,000 gal total)
Pad-Mounted Transformer Mineral Oil	12,000 gal per transformer, up to 24,000 gallons	12,000 gal per transformer, up to 24,000 gallons	12,000 gal per transformer, up to 24,000 gallons

Several conservation measures will be undertaken during operations:

- Water usage at the site will be closely monitored during operations due to the limited capacity of the on-site water storage tank.
- The O&M facility will utilize station power for electricity needs.
- Water usage at the site will be closely monitored during operations due to the limited capacity of the on-site water storage tank.
- Carpooling among operations workers will be encouraged.
- High-efficiency electrical fixtures and appliances in the O&M facility and substation control house will be used.
- Low-water-use flush toilets will be used in the O&M facilities
- Recycling of waste office paper and aluminum will be encouraged.

Table 1-2 continued.

<b><i>Decommissioning Impacts</i></b>	Similar to most likely scenario	Impacts on energy consumption during project dismantling would be similar to construction. Water would be required only as a dust control measure. No steel, cement, gravel, or sand would be required. Energy consumption, mainly gasoline, diesel fuel, and electricity, would be required to operate equipment. Economically recoverable materials such as steel towers would be salvaged. Dismantling would also eliminate the need for maintenance requirements (i.e., fuel, O&M facility water, gear oil, hydraulic fluid, glycol-water mix coolant).	Similar to most likely scenario
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**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated, and the environmental impacts described in this section would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area, which is zoned Commercial Agriculture and Forest and Range. According to the County’s zoning code, the Commercial Agriculture zone is dominated by farming, ranching, and rural lifestyles, and permitted uses include residential, greenhouses, and agricultural practices. Permitted uses in the Forest and Range zone include logging, mining, quarrying, and agricultural practices, as well as residential uses. However, if the proposed project is not constructed, it is likely that the region’s need for power would be addressed by user-end energy efficiency and conservation measures, by existing power generation sources, or by the development of new renewable and non-renewable generation sources. Baseload demand would likely be filled through expansion of existing, or development of new, thermal generation such as gas-fired combustion turbine technology. Such development could occur at conducive locations throughout the state of Washington, and impacts on energy and natural resources could be similar to or even greater than the proposed action depending on the location, type, and magnitude of development at the project site. The significance of such impacts would depend on the site-specific location and project design.

A baseload natural gas-fired combustion turbine would have to generate 67 average-MW of energy to replace an equivalent amount of power generated by the project (204-MW at 33% net capacity). (An average-MW or “aMW” is the average amount of energy supplied over a specified period of time, in contrast to “MW,” which indicates the maximum or peak output [capacity] that can be supplied for a short period.) See Section 2.7, “No Action Alternative.”

**3.8 NOISE**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	<b><i>Mitigation Measures Recommended</i></b>
<b><i>Construction Impacts</i></b>				
Noise generated by construction equipment.	Same as most likely scenario.	No impact. Nearest home is more than 2 miles away from the closest WTG.	Same as most likely scenario.	Although no specific receivers are identified as being impacted by construction noise at the remote project site, the following contractor practices are recommended to minimize the

**Table 1-2 continued.**

Blasting noise/conflicts with nearby residential/land use.	Same as most likely scenario.	No impact. Blasting would be done only during daytime, and the nearest home is more than 3 miles away from the closest rock quarry.	Same as most likely scenario.	practices are recommended to minimize the effects of construction noise in the project area: <ul style="list-style-type: none"> <li>▪ Implement work-hour controls so that noisy activities occur between 7 a.m. and 10 p.m., which would reduce the impact during sensitive nighttime hours.</li> <li>▪ Do not allow heavy-duty haul trucks to travel through the town of Kittitas during evening or nighttime hours.</li> <li>▪ Do not allow haul trucks to park and idle within 100 feet of a residential dwelling. Conduct blasting only during daylight hours.</li> </ul>
Noise generated by construction traffic in town of Kittitas.	Same as most likely scenario.	Unlikely to cause any adverse impact. Commute vehicles and up to 49 heavy trucks per hour would cause traffic noise levels to exceed FHWA impact thresholds only at homes within 60 feet of the street centerline.	Same as most likely scenario.	<ul style="list-style-type: none"> <li>▪ Maintain equipment in good working order and use adequate mufflers and engine enclosures to reduce equipment noise during operation.</li> <li>▪ Coordinate construction vehicle travel to reduce the number of passes by sensitive receivers.</li> </ul>
<b>Operation and Maintenance Impacts</b>				
Noise generated by wind turbines.	Same as most likely scenario.	No impact. Operational noise levels would be less than background at the nearest homes.	Same as most likely scenario.	
Noise generated by high-voltage transmission lines.	Same as most likely scenario.	No impact. Noise levels would be less than Washington state limits at all points outside the transmission line right-of-way.	Same as most likely scenario.	
Noise generated by traffic.	Same as most likely scenario.	No impact. Commute traffic would consist of only 36 trips a day, or 18 trips during the peak hour.	Same as most likely scenario.	
Vibration effects.	Same as most likely scenario.	No impact. Nearest home is 2 miles from the nearest WTG.	Same as most likely scenario.	
<b>Decommissioning Impacts</b>				
Construction trucks along streets in town of Kittitas.	Same as most likely scenario.	Decommissioning activities would result in less noise than for construction due to little or no blasting and heavy equipment would be used for a shorter period.	Same as most likely scenario.	

Table 1-2 continued.

Traffic noise caused by heavy haul trucks traveling through the town of Vantage might occasionally exceed FHWA's traffic noise impact criterion at the homes along the streets.

**No Action Alternative**

The No Action Alternative assumes that future development at the site would comply with existing zoning requirements for the project area, which is zoned Commercial Agriculture and Forest and Range. According to the County's zoning code, the Commercial Agriculture zone is dominated by farming, ranching, and rural lifestyles, and permitted uses include residential, green houses, and agricultural practices. Permitted uses in the Forest and Range zone include logging, mining, quarrying, and agricultural practices, as well as residential uses. Agricultural activity and low-density housing would generate no significant noise impacts at residences. Any proposed mining or quarrying activity would be subject to noise restrictions under Chapter 173-60 WAC, Maximum Environmental Noise Levels.

If the project is not constructed, the region's need for power would be addressed by developing other generation sources. The construction and operation of a base load gas-fired combustion turbine would create more noise than the proposed wind generation project. The noise impacts of a gas turbine generator would depend on its proximity to homes. Development of renewable energy facilities could result in similar noise levels of the WHWPP, the impacts depending on the proximity to homes.

Noise from the decommissioning of other energy facilities would depend on the extent of the facilities being removed.

**3.9 LAND USE**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b>Construction Impacts</b>				<i>Mitigation Measures Proposed by Applicant</i>
Project Temporary Disturbance Area	289.5 acres	356.0 acres	401.4 acres	During project construction, it would be necessary to remove cattle from areas where blasting or heavy equipment operations are taking place. The Applicant would make arrangements with property owners and livestock owners to keep livestock out of these areas during those periods.
Agriculture Crops Removed from Cultivation	None	None	None	
Livestock Grazing	Same as most likely scenario.	Reduction in available land for livestock grazing. Domestic animals temporarily removed from construction sites for one grazing season	Same as most likely scenario.	
<b>Operation and Maintenance Impacts</b>				The Applicant would allow controlled hunting to avoid creating a sanctuary for elk and deer that may cause an increase in agricultural damage to neighboring landowners.
Project Permanent Disturbance Area	164.7 acres	164.7 acres	164.6 acres	
Agricultural Crops Removed from Cultivation	None	None	None	

**Table 1-2 continued.**

***Decommissioning Impacts***

Temporary land disturbance	Similar to construction; no permanent land use impacts	Similar to construction; no permanent land use impacts  Upon decommissioning, acreage taken out of open space and rangeland use could be returned to these prior uses. Livestock grazing, if occurring, would be abated during dismantling activities. Landowners may use and maintain some of the access roads installed by the project.	Similar to construction; no permanent land use impacts
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**No Action Alternative**

Under the No Action Alternative, the project would not be constructed and existing land uses in the project area would continue without the influence of the proposed project. The specific type, nature, and extent of future developments at the project site are unknown, and would depend primarily on county growth trends. The Kittitas County Comprehensive Plan and Zoning Code would govern development at the project site.

Under the No Action Alternative, the region’s power needs could be addressed through development of other energy facilities. Such development could occur at conducive locations throughout the state of Washington. Impacts to agriculture would depend on the specific location of the projects.

**3.10 VISUAL RESOURCES/LIGHT AND GLARE**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b><i>Construction Impacts</i></b>				<b><i>Mitigation Measures Proposed by Applicant</i></b>
Rotor Diameter	295 ft.	231 ft.	197 ft.	Mitigation measures proposed by the Applicant and incorporated into the project’s design include the following.  <ul style="list-style-type: none"> <li>▪ Active dust suppression will be implemented to minimize the creation of dust clouds during the construction period.</li> <li>▪ Areas disturbed during the construction process will be reseeded to facilitate their return to natural-appearing conditions when construction is complete.</li> <li>▪ The wind turbine towers, nacelles, and rotors used will be uniform and will conform to the highest standards of industrial design to present a trim, uncluttered, aesthetically attractive appearance.</li> </ul>
Number of Turbines	104	136	158	
Total Height	410 ft.	378 ft.	361 ft.	
Construction Activity Overall	Same as most likely scenario	Moderate	Same as most likely scenario	
Construction Equipment	Same as most likely scenario	Highly visible from nearby areas	Same as most likely scenario	
Laydown Areas	Same as most likely scenario	Temporarily stored turbine components, equipment, and vehicles would be visible	Same as most likely scenario	

**Table 1-2 continued.**

Localized dust clouds (soil disturbance)	Same as most likely scenario	Periodic, small, localized clouds of dust would be visible during grading activities	Same as most likely scenario	<ul style="list-style-type: none"> <li>▪ The turbines will have neutral gray finish to minimize contrast with the sky backdrop.</li> <li>▪ A low-reflectivity finish will be used for all surfaces of the turbines to minimize the reflections that can call attention to structures in a landscape setting.</li> </ul>
<b><i>Operation and Maintenance Impacts</i></b>				
View 1 – Vantage Highway Corridor South of Project Site	Same as most likely scenario	Moderate	Same as most likely scenario	<ul style="list-style-type: none"> <li>▪ The rotors will be turning approximately 80–85% of the time as a result of local wind conditions and the equipment used. This will minimize the appearance of the turbines being non-operational.</li> </ul>
View 2 – Valley Lands at Eastern Edge of Kittitas Valley	Same as most likely scenario	Moderate	Same as most likely scenario	<ul style="list-style-type: none"> <li>▪ The small cabinets containing pad-mounted equipment that will be located at the base of each turbine will have an earth-tone finish to help them blend into the surrounding ground plane.</li> </ul>
View 3 – Lands to the West, North, and East of Project Site	Same as most likely scenario	Moderate	Same as most likely scenario	<ul style="list-style-type: none"> <li>▪ The only exterior lighting on the turbines will be the aviation warning lighting required by the FAA. This lighting will be kept to the minimum required intensity to meet FAA standards. It is anticipated that the FAA will soon be issuing new standards for marking of wind turbines that will entail lighting fewer turbines in a large wind farm than is now required, as well as synchronizing all the lights. These potential regulatory changes are being closely monitored and if, as is likely, they are made before project construction begins, the aviation safety marking lighting will be designed to meet these revised standards.</li> </ul>
View 4 – Kittitas and Surrounding Valley Areas	Same as most likely scenario	Low	Same as most likely scenario	
View 5 – Lands East of the Columbia River	Same as most likely scenario	Low	Same as most likely scenario	
View 6 – I-90 in the Vicinity of the PSE Interconnect	Same as most likely scenario	Low	Same as most likely scenario	

Table 1-2 continued.***Decommissioning Impacts***

If the project were repowered, visual impacts would likely be similar to those of the proposed facility. If dismantled, site disturbance would be visible on close examination for several years. The visual impacts of aboveground elements not removed would remain. Construction activities during the decommissioning process would be visibly similar to, but for less duration than, those of construction. The visual landscape would be restored to pre-project conditions.

- Most of the project's electrical collection system will be located underground, eliminating potential visual impacts.
- Where feasible, existing road alignments will be used to provide access to the turbines, minimizing the amount of additional surface disturbance required. Where possible, access road widths will be restricted to 20 feet (approximately half of all access road miles.) The access roads will have a gravel surface and will have grades of no more than 15%, minimizing erosion and its visual effects.
- The O&M facility building will have a low-reflectivity earth-tone finish to maximize its visual integration into the surrounding landscape.
- The parking areas at the O&M facility will be covered with gravel, rather than asphalt, to minimize contrast with the site's soil colors.
- Outdoor night lighting at the O&M facility and the substation(s) will be kept to the minimum required for safety and security, sensors and switches will be used to keep lighting turned off when not required, and all lights will be hooded and directed to minimize backscatter and offsite light trespass.
- All equipment at the substation(s) will have a low-reflectivity neutral gray finish to minimize visual sensitivity.
- All insulators in the substations and takeoff towers will be non-reflective and non-refractive.
- The control buildings located at each substation will have a low-reflectivity earth-tone finish.
- The chain-link fences surrounding the substations will have a dulled, darkened finish to reduce their contrast with the surroundings.

Table 1-2 continued.

**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated, and the visual and aesthetic impacts described for the Proposed Action would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area.

In the short-term, the visual character of foreground, midground, and distant views would remain similar to the existing conditions. The existing views are primarily of open, non-forested hillside rangelands. It is likely these conditions would persist into the long-term unless the present zoning is changed allowing for a different land use, or the land is purchased and converted to a different use (i.e., mining, or different agricultural use) permitted under the County’s zoning code.

If the proposed project is not constructed, it is likely that the region’s need for power would be addressed by user-end energy efficiency and conservation measures, by existing power generation sources, or by the development of new renewable and non-renewable generation sources. Visual and aesthetic impacts would depend on the type of facility being constructed.

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**3.11 POPULATION, HOUSING, AND ECONOMICS**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b>Construction Impacts</b>				<b>Mitigation Measures Proposed by Applicant</b>
Increased influx of temporary and permanent workers in the area.	Same as most likely scenario.	Construction total of 250 employees; maximum 160 employees during peak construction month. Operational workforce of 14 to 18 personnel	Same as most likely scenario.	There is an adequate supply of temporary housing available to accommodate non-local workers; therefore, no mitigation measures are proposed. The overall socioeconomic impact of the project for the County would be increased property tax base and employment opportunities; therefore, no mitigation measures are planned for population, housing, and economics.
Increased demand for temporary and permanent housing.	Same as most likely scenario.	Total 240 rooms or units available during peak time; 760 rooms or units non-peak; 1,000 vacant, non-seasonal housing units in the County.	Same as most likely scenario.	
<b>Operation and Maintenance Impacts</b>				
Increased employment and spending/income	Same as most likely scenario.	Total 250 employees; maximum 160 employees during peak construction month. Operational workforce of 14 to 18 personnel; \$4.8 million in total income and 71 jobs for construction; \$1.4 million and up to 30 jobs for operations; \$376,000 income to landowners.	Same as most likely scenario.	

**Table 1-2 continued.**

<b>Decommissioning Impacts</b>	Similar to most likely scenario	Decommissioning activities would result in beneficial but temporary construction employment similar to that projected for facility construction. If subsequent economic uses of the project site were not developed, facility closure would represent a minor long-term loss of employment and associated economic activity for the local and regional economy, a loss of tax base, and property tax revenues.	Similar to most likely scenario
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**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated, and socioeconomic impacts described for the Proposed Action would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area, which is zoned Commercial Agriculture and Forest and Range.

Pending the proposal of other significant or influential development within the area, population growth and business development and the associated revenues to the County would likely continue on the same trend that currently exists.

If the project were not constructed, the region’s power needs could be delivered through development of other generation facilities. The socioeconomic impacts of other facilities would largely depend on the revenue generated, and the temporary and permanent direct and indirect employment generated.

**3.12 PUBLIC SERVICES AND UTILITIES/RECREATION**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b>Construction Impacts</b>				<b>Mitigation Measures Proposed by Applicant</b>
Increased demand for police protection services (e.g., traffic violations, accidents)	Same as most likely scenario	Construction total of 253 employees; maximum 160 employees during peak construction month.	Same as most likely scenario.	Potential impacts to public services and utilities will be mitigated by tax revenues generated by the project. Fiscal impacts of the project are addressed in Section 3.11, “Population, Housing and Economics.”
Increased fire risk/demand for fire protection services	289 acres disturbed during construction. 164.7 acres of permanently disturbed acres with 104 WTG	356 total acres disturbed during construction. 164.7 permanently disturbed acres with 136 WTG	401 total acres disturbed during construction. 164.4 acres permanently disturbed acres with 158 WTG.	Because construction activities at the project are not expected to result in significant impacts to medical services, schools, public utilities, communications, water supplies, sewage/solid waste disposal, or stormwater systems, no mitigation measures will be necessary for those services or utilities.

Table 1-2 continued.

Increased demand for emergency medical services	Same as most likely scenario	Total of 253 construction employees with a maximum 160 employees during peak construction month.	Same as most likely scenario.	The following mitigation measures will be implemented to reduce impacts to those public services potentially affected by construction of the project:
Increased demand for school services	Same as most likely scenario.	Total 253 employees; maximum 160 employees during peak construction month.	Same as most likely scenario.	The Applicant will provide all police, fire, and emergency medical personnel with emergency response details for the project.
Increased demand for recreational resources by construction employees	Same as most likely scenario.	160 employees during peak construction month.	Same as most likely scenario.	<b>Law Enforcement</b> The Applicant will consult with the County regarding the impact on county law enforcement staffing. If additional staffing is required, the Applicant proposes to mitigate by prepaying a sufficient amount of taxes to provide adequate staffing levels during construction.
<b>Operation and Maintenance Impacts</b>				
Increased demand for police protection services (e.g., traffic violations, accidents)	Same as most likely scenario	Operational workforce of 14-18 personnel	Same as most likely scenario.	
Increased fire risk/demand for fire protection services	Same as most likely scenario	Same acreage as construction but lower risk from fewer personnel	Same as most likely scenario	<b>Fire Protection</b> The Applicant has initiated discussions with local fire district(s) regarding a contract for fire protection services during construction and ongoing fire protection services during operations.
Increased demand for emergency medical services	Same as most likely scenario	Operational workforce of 14-18 personnel	Same as most likely scenario.	
Increased demand for school services	Same as most likely scenario.	Operational workforce of 14-18 personnel.	Same as most likely scenario.	The Applicant will provide provisions for special training of fire district personnel for fires related to wind turbines; detailed maps to fire districts that show all access roads to the project; use of spark arresters on all power equipment (e.g., cutting torches and cutting tools), when necessary due to extreme fire danger conditions; carrying fire extinguishers in all maintenance vehicles; supplying water for fire fighting at locations up and beyond the contracted fire districts to keep the fire in a manageable size incident; implementing an FAA-style lighting plan to prevent aircraft mishaps to limit fire response.
Conflicts between onsite and offsite recreation and operations	Same as most likely scenario.	Some public access allowed onsite	Same as most likely scenario.	
Increased demand for recreational resources by operation employees	Same as most likely scenario.	14-18 O&M personnel.	Same as most likely scenario.	
Increased demand for water	10.5 million gallons; <1,000 gallons per day at O&M facility	10.7 million gallons; <1,000 gallons per day at O&M facility.	10.8 million gallons; <1,000 gallons per day at O&M facility.	

Table 1-2 continued.

Increased demand for sewage treatment	Same as most likely scenario	Sanitary waste discharged to portable toilets; 253 total construction employees. Wastewater from operational workforce of 14-18 people discharged to onsite septic tanks	Same as most likely scenario.	<p><b>Emergency Medical Services</b></p> <p>Measures include training for operations personnel and EMS personnel in the use of a rescue basket that will be kept at the operations and maintenance facility for the purpose of removing injured employees from the WTGs; providing keys to a master lock system to fire districts that will enable emergency personnel to unlock gates that would otherwise limit access to the project; informing workers at the project of emergency contact phone numbers and training them in emergency response procedures.</p>
Increased demand for solid waste disposal services	Same as most likely scenario	Construction volume of CDL wastes <100 tons. Operational wastes of 1-2 dumpsters per week.	Same as most likely scenario.	
Conflicts between onsite and offsite recreation and operations	289 acres of construction disturbance, 164.7 permanent.	356 construction acres of disturbance, 164.7 permanent.	401 acres of construction disturbance, 164.6 permanent.	<p><b>Communication Systems</b></p> <p>A FCC-style communication study or appropriate study will be conducted to ensure that emergency responders communications will not be derogated by the wind generators, thus eliminating or reducing all communications on site by any emergency responders.</p>
Increased demand for recreational resources by construction and operation employees	Same as most likely scenario.	160 employees during peak construction month; 14-18 O&M personnel.	Same as most likely scenario.	
<b><i>Decommissioning Impacts</i></b>	Similar to construction	Similar to construction  Respective public and private landowners will determine public access in the event of project termination, abandonment, or cessation of operation at the appropriate time.	Similar to construction	<p>An environmental clean-up company will be under contract to provide services to protect the environment up to and beyond small incidents, including planning, implementing, and storing of all material considered to be harmful.</p> <p>During operation of the project, impacts to local services and utilities are expected to be insignificant. However, emergency preparedness planning will be implemented as mentioned above, to reduce potential impacts in the event of an emergency.</p> <p>The Applicant will make arrangements with the Kittitas Valley Community Hospital for helicopter transportation service in the unlikely event that any operations personnel are seriously injured and require evacuation from a remote location within the project area.</p>

Table 1-2 continued.

The Applicant will have signed agreements to provide for emergency services, fire, and EMS, with closest Fire/Hospital District or Department prior to work starting on any phase of the project once approval is given, even if the sites are within fire district boundaries so as to not impact taxpayers.

The Applicant will work with Kittitas County Fire Marshal and effected fire districts for all aspects of operations.

**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated, and the impacts to public services and utilities and recreation described for the Proposed Action would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area, which is zoned Commercial Agriculture and Forest and Range.

If the project were not constructed, the region’s power needs could be delivered through development of other generation facilities. The impacts to public services of other facilities would largely depend on the type and location of the facilities.

**3.13 CULTURAL RESOURCES**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	
<b><i>Construction Impacts</i></b>				<b><i>Mitigation Measures Recommended</i></b>  As recommended by the Assistant Archaeologist at OAHP, 100-foot design and construction buffers will be maintained around the archaeological and historical sites identified during this current cultural resource survey, even though they do not meet the standard qualifications for NRHP. OAHP requested that the project archaeologist flag off or otherwise delineate the archaeological sites with a 100-foot buffer. Ground disturbing actions within a specified radius of any archaeological sites, either recorded during the initial survey or previously documented, will be monitored by a professional archaeologist to prevent damage or
Archaeological or historical sites identified within project area	None	None	None	
<b><i>Operation and Maintenance Impacts</i></b>				
Archaeological or historical sites identified within project area	None	None	None	
<b><i>Decommissioning Impacts</i></b>				

**Table 1-2 continued.**

Archaeological or historical sites identified within project area	None	None	None	<p>professional archaeologist to prevent damage or destruction to both known and unanticipated archaeological resources.</p> <p>If any archaeological materials, including but not limited to human remains, are observed, excavation in that area will cease, and OAHP, EFSEC, the affected tribes and the Applicant will be notified. At that time, appropriate treatment and mitigation measures will be developed and implemented. If the project cannot be moved or re-routed to avoid resources, the resources will be tested for eligibility for listing in the NRHP. Any excavation or disturbance to the archaeological sites will require an excavation permit from OAHP per RCW 27.53.060. The archaeologist will remove any flagging tape or pin flags at the end of the construction-monitoring phase of the project.</p> <p>If a tribe requests to have one of its representatives present during earth-disturbing construction activities, the Applicant will comply with their wishes.</p>
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**No Action Alternative**

Under the No Action Alternative, the project would not be constructed or operated, and the environmental impacts described in this section would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area, which is zoned Commercial Agriculture and Forest and Range.

If the project were not constructed, the region’s power needs could be delivered through development of other generation facilities. Impacts to cultural resources would depend on the land area impacted, and density of cultural resources on the facility sites.

**3.14 TRAFFIC AND TRANSPORTATION**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW	<b>Mitigation Measures Proposed by Applicant</b>
<b>Construction Impacts</b>				
Construction trips	728 daily trips 458 daily trips <sup>1</sup>	812 daily trips 498 daily trips <sup>1</sup>	770 daily trips 478 daily trips <sup>1</sup>	<ul style="list-style-type: none"> <li>▪ The Applicant will prepare a Traffic Management Plan (to be submitted to EFSEC prior to construction for review), with the construction contractor outlining steps for minimizing construction traffic impacts.</li> </ul>
Parking requirements	Same	Approx. 2 acres	Same	

**Table 1-2 continued.**

Hazardous materials transport	Same	Diesel fuel and gasoline required for mobile construction equipment	Same	<ul style="list-style-type: none"> <li>minimizing construction traffic impacts;</li> <li>▪ The Applicant will provide notice to adjacent landowners when construction takes place to help minimize access disruptions;</li> </ul>
Roadway limitations	Less than 1.5 MW proposal because of 14% fewer trucks	Large number of trucks and trucks exceeding legal weight limits may cause pavement deterioration.	Less than 1.5 MW proposal because of 7% fewer trucks	<ul style="list-style-type: none"> <li>▪ The Applicant will provide proper road signage and warnings of “Equipment on Road,” “Truck Access,” or “Road Crossings” along Vantage Highway;</li> </ul>
Roadway hazards	Less than 1.5 MW proposal because of 14% fewer trucks	Increased risk of accidents.	Less than 1.5 MW proposal because of 7% fewer trucks	<ul style="list-style-type: none"> <li>▪ When slow or oversized wide loads are being hauled, appropriate vehicle and roadside signing and warning devices will be deployed per the Traffic Management Plan. Pilot cars will be used as the DOT dictates, depending on load size and weight;</li> </ul>
Aviation hazards	Same	No adverse effect	Same	<ul style="list-style-type: none"> <li>▪ The Applicant will construct necessary site access roads and an entrance driveway that will be able to service truck movements of legal weight and provide adequate sight distance;</li> </ul>
<b><i>Operation and Maintenance Impacts</i></b>				
Operational trips	Same	36 daily trips	Same	<ul style="list-style-type: none"> <li>▪ The Applicant will encourage carpooling for the construction workforce to reduce traffic volume;</li> </ul>
Parking requirements	Same	Approx. 30 spaces	Same	<ul style="list-style-type: none"> <li>▪ In consultation with Kittitas County, the Applicant will provide detour plans and warning signs in advance of any traffic disturbances;</li> </ul>
Hazardous materials transport	Same	No adverse effect	Same	<ul style="list-style-type: none"> <li>▪ The Applicant will employ flaggers as necessary to direct traffic when large equipment is exiting or entering public roads to minimize risk of accidents;</li> </ul>
Road limitations	Same	No adverse effect	Same	
Road navigation hazards	Same	No adverse effect	Same	
Aviation hazards	Less than 1.5 MW proposal because of fewer wind turbines	Some risk to aviation because of wind turbine height, numbers, and placement.	More than the 1.5 MW proposal because there are more wind turbines	
Road maintenance and public access requirements	Same	32 miles (165 acres) of roadways to maintain	Same	
Tourism-induced traffic	Unknown	Unknown	Unknown	

**Table 1-2 continued.**

***Decommissioning Impacts***

Slightly less than 1.5 MW proposal as there are fewer wind turbines	Similar to those described for construction. However, assuming that roadways would remain in place, the resulting workforce and corresponding vehicle trips would be smaller	Slightly more than 1.5 MW proposal as there are more wind turbines
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- Where construction may occur near the roadway, one travel lane will be maintained at all times.

Additional recommended mitigation to be implemented includes the Applicant will videotape Transporter Route 1 roadways to document pavement conditions before and after construction and address changes in discussions with the City of Kittitas and Kittitas County.

Operation and maintenance of the project would not significantly affect traffic, however, the following measure to follow FAA guidelines for a wind turbine lighting and warning system is proposed.

**No Action Alternative**

Under the No Action Alternative, the WHWPP would not be constructed or operated. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area, which is zoned Commercial Agriculture and Forest and Range. According to the county’s zoning code, the Commercial Agriculture zone is dominated by farming, ranching, and rural lifestyles, and permitted uses include residential, green houses, and agricultural practices. Permitted uses in the Forest and Range zone include logging, mining, quarrying, and agricultural practices, as well as residential uses.

Based on the continued use of the site without change, average daily trips from the site would be one or fewer.

If the proposed project were not built, additional renewable and non-renewable energy facilities may have to be constructed to meet regional power needs. Impacts to traffic and transportation would depend on the specific location of such projects and current transportation services available in the vicinity of the sites

**3.15 HEALTH AND SAFETY**

<b>Proposed Action</b>	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1.0 MW
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***Construction Impacts***

Fire or Explosion <sup>1</sup>	Less than Most Likely Scenario	Primary Concern – Fire Protection and Prevention Plan to address.	Greater than Most Likely Scenario
Release of Hazardous <sup>1</sup> Materials	Less than Most Likely Scenario	Fuel, mineral oil, and lubricating oil spills possible. SPCC Plan to address.	Greater than Most Likely Scenario

***Mitigation Measures Proposed by Applicant***

The Applicant and its subcontractors would comply with all applicable local, state, and federal safety, health, and environmental laws, ordinances, regulations, and standards.

The wind turbines for the proposed project would meet international engineering design and manufacturing safety standards including the International Electrotechnical Commission

Table 1-2 continued.

Terrorism/Sabotage/ Vandalism	Same as Most Likely Scenario	Site access controlled. Security Plan to provide specifics.	Same as Most Likely Scenario	standard 61400-1: Wind Turbine Generator Systems–Part I: Safety Requirements.  <b>Fire and Explosion</b>  All onsite service vehicles will be fitted with fire extinguishers. Fire station boxes with shovels, water tank sprayers, etc., will be installed at multiple locations on site along roadways during summer fire season. A minimum of one water truck with sprayers will be present on each turbine string road during construction activities during fire season.
<b>Operation and Maintenance Impacts</b>				
Fire or Explosion <sup>1</sup>	Less than Most Likely Scenario	Primary Concern – Fire Protection and Prevention Plan to address.	Greater than Most Likely Scenario	No gas-powered vehicles will be allowed outside of graveled areas. Mainly diesel vehicles (i.e., without catalytic converters) will be used on site. Any vehicles used off road on site will be high-clearance vehicles.  Smoking will be restricted to designated areas (outdoor gravel covered areas).
Release of Hazardous <sup>1</sup> Materials	Less than Most Likely Scenario	Lubricating oil, ethylene glycol/water mix, hydraulic fluids, and mineral oil spills possible. SPCC Plan to address.	Greater than Most Likely Scenario	Only state-licensed explosive specialist contractors are allowed to perform this work. Explosives require special detonation equipment with safety lockouts. Vegetation will be cleared from the general footprint area surrounding the excavation zone to be blasted. Standby water spray trucks and fire suppression equipment will be present during blasting activities.
Gearbox – Lubricating Oil	110 gallons per turbine 11,440 gallons total	90 gallons per turbine 12,240 gallons total	70 gallons per turbine 11,060 gallons total	
Cooling System – Ethylene Glycol/ Water Mix	55 gallons per turbine 5,720 gallons total	40 gallons per turbine 5,440 gallons total	30 gallons per turbine 4,470 gallons total	All equipment will be designed to meet NEC and NFPA standards. All area surrounding substation, fused switch risers on overhead pole line, junction boxes and pad switches will be graveled with no vegetation. A fire suppressing, rock-filled oil containment trough will be created around the substation transformer.
Hydraulic System – Hydraulic Fluid	85 gallons per turbine 8,840 gallons total	65 gallons per turbine 8,840 gallons total	45 gallons per turbine 7,110 gallons total	
Substation Transformer – Mineral Oil	Same as Most Likely Scenario	12,000 gallons per transformer up to 24,000 gallons	Same as Most Likely Scenario	Specially engineered lightning protection and grounding systems will be used at wind turbines and at substation. Footprint areas around turbines and substation will be graveled with no vegetation.

**Table 1-2 continued.**

Pad-Mounted Transformer – Mineral Oil	500 gallons per transformer 52,000 gallons total	500 gallons per transformer 68,000 gallons total	500 gallons per transformer 79,000 gallons total	Generators will not be allowed to operate on open grass areas. All portable generators will be fitted with spark arrestors on exhaust system.
Maximum Tower Collapse Hazard Zone Distance/Risk	410 feet/Same as Most Likely Scenario	344 feet/Low	295 feet/ Same as Most Likely Scenario	Fire suppression equipment will be present at location of welder/torch activity. Immediate surrounding area will be wetted with water sprayer.
Estimated Maximum Blade Throw Distance/Risk	410 feet/ Same as Most Likely Scenario	344 feet/Low	295 feet/ Same as Most Likely Scenario	<b>Release of Hazardous Materials</b> A Phase I Environmental Site Assessment for the project site did not reveal the presence or potential presence of any environmental contamination. If contaminated soils are found the Applicant would coordinate with Ecology for corrective measures.
Estimated Maximum Ice/Blade Fragment Throw Distance/Risk	Same as Most Likely Scenario	328 feet/Low	Same as Most Likely Scenario	
Shadow-Flicker	None	None	None	
Terrorism/Sabotage/Vandalism	Same as Most Likely Scenario	Site access controlled. Motion sensors and security lighting to be installed. Security Plan to provide specifics.	Same as Most Likely Scenario	<b>Emergency Medical Response</b> Mitigation measures outlined in 3.12 Public Services would apply here. Emergency plans would be prepared in cooperation with the appropriate local authority and employees and emergency response personnel would be trained accordance with these plans.
Electromagnetic Field	Same as Most Likely Scenario	Minimal field strengths at existing nearby residences.	Same as Most Likely Scenario	
Electrical Shock	Same as Most Likely Scenario	Minimal hazard. Applicant committed to grounding metal objects along transmission line routes.	Same as Most Likely Scenario	<b>Aircraft Impact</b> The project facilities would be marked and lighted in accordance with FAA regulations to minimize the potential for a low-flying aircraft to collide with a structure.
<b>Decommissioning Impacts</b>				
Fire or Explosion	Similar to construction	Similar to construction	Similar to construction	<b>Transmission Line Audible Noise and Electromagnetic Interference</b>
Release of Hazardous Materials	Similar to construction	Similar to construction	Similar to construction	The conductors for the proposed transmission line would be of sufficient diameter to control corona effects.

Table 1-2 continued.

Terrorism, Sabotage, Vandalism	Similar to construction	Similar to construction	Similar to construction	<p><b>Emergency Plans</b></p> <p>Emergency plans would be prepared by the Applicant to protect public health and safety, and the environment on and off the site in the case of a major natural disaster or industrial accident relating to or affecting the proposed project. The applicant would be responsible for implementing the plans in coordination with the local emergency response support organizations. The plans would address medical emergencies; construction emergencies; project evacuation; fire protection and prevention; floods; extreme weather abnormalities; earthquakes; volcanic eruption; facility blackout; spill prevention, control, and countermeasures; blade or tower failure; aircraft impact; terrorism, sabotage, or vandalism; and bomb threat.</p>
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<sup>1</sup>Risk primarily a function of the number of towers.

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**No Action Alternative**

Under the No Action Alternative, the proposed project would not be constructed. The risk of fire due to lightning strikes or human activity in the general area would still exist. If the proposed project were not built, additional renewable and non-renewable energy facilities may have to be constructed to meet regional power needs. Health and Safety impacts would depend on the type and location of facility that is constructed.

**Table 1-3.** Comparison of Potential Impacts of Proposed Action and Off-Site Alternatives

Alternative	Impacts
<b>3.1 EARTH RESOURCES</b>	
<b>Proposed Action</b>	<p>Impacts on topography, geologic units, and soils from project construction would result from clearing, excavation and filling associated with constructing roads, establishing temporary crane pads and constructing the base for each turbine, and installation of underground and overhead electrical lines. Total site disturbance would range from 289 acres to 401 acres. Erosion would result from site disturbance and cut and fill activities. Construction (cut and fill) of access roads in some areas could occur on or under relatively steep slopes, therefore, some sliding of soil and alluvial materials could be expected during construction</p> <p>No significant impacts on soils or topography are anticipated during project operation and maintenance</p> <p>Most of the project facilities would not be located on unstable slopes or landslide-prone terrain. The turbines would be located on the tops of ridges, on relatively flat areas, and not on steep slopes. Therefore, sliding of near-surface soils and rock is unlikely in these areas.</p> <p>Development would have no influence on the level of seismic or volcanic hazard in the project area. A large earthquake in the project area could impact wind power operations, disrupt the regional electrical distribution system, damage wind power equipment, or cause collapse of the turbine towers. Project design and implementation of emergency plans would minimize these potential impacts and protect the public health and safety and environment in the project vicinity.</p> <p>Decommissioning would consist of removing above-ground equipment such as wind turbines, meteorological towers, and their associated foundations to a depth of 3 feet below the ground surface. These activities would slightly alter topography and potentially cause minor erosion.</p>
<b>Kittitas Valley</b>	<p>Project construction activities would result in soil impacts. The total amount of ground disturbance during construction would range from 231 acres to 371 acres. Total site disturbance and cut-and-fill activities in steep slope areas could result in significant erosion and some sliding of soil and alluvial materials. Soils and surface topography would not be altered after construction of the project is complete. Landscaping, grass, and other vegetative cover would prevent significant soil erosion during operation and maintenance of the project. A detailed Stormwater Pollution Prevention Plan and site-specific BMPs would minimize the potential for pollutant discharge and erosion from the project site during construction and operations. Imported fill materials would be required primarily for construction of access roads and turbine foundations. Between 232.5 and 259.9 cubic yards of fill would be required depending on the project scenario selected. Fill would be transported to the site from local gravel sources.</p> <p>Development would have no influence on the level of seismic or volcanic hazard in the project area. A large earthquake in the project area could impact wind power operations, disrupt the regional electrical distribution system, damage wind power equipment, or cause collapse of the turbine towers. Project design and implementation of emergency plans would minimize these potential impacts and protect the public health and safety and environment in the project vicinity.</p> <p>Decommissioning activities would slightly alter topography and potentially cause minor erosion.</p>

Table 1-3 continued.**Alternative****Impacts****Desert Claim**

Short-term impacts to soils during project construction and decommissioning include clearing and grading, excavation, and fill for access roads, underground cable trenching, and turbine pads. Erosion could potentially result in increased sedimentation to surface water features, gully erosion, slope instability, and slope failures such as earth slumps, debris flows/slumps, and rock falls. The increased risk of erosion and landslides would be addressed by BMPs such as sediment and erosion control measures, setbacks, micro-siting, and additional geological studies.

During project operation, the risk of erosion would be similar to existing conditions. However, impervious surfaces associated with the O&M building, substation, project access roads, and footings of turbines/transformers could increase runoff and pose a risk, especially on steep slopes. Potential soil loss and landslide impacts can be mitigated to acceptable levels with proper implementation of BMPs and erosion control measures. Plans for siting and design of project facilities will consider existing seismic risks present in the area.

It is likely that fill requirements would be similar to those for the KVVPP. Fill may be imported from off-site sources, if insufficient native materials are available.

Development would have no influence on the level of seismic or volcanic hazard in the project area. A large earthquake in the project area could impact wind power operations, disrupt the regional electrical distribution system, damage wind power equipment, or cause collapse of the turbine towers. A volcanic eruption could potentially contribute hazards from volcanic ash. Project design and implementation of emergency plans would minimize these potential impacts and protect the public health and safety and environment in the project vicinity.

Decommissioning activities would slightly alter topography and potentially cause minor erosion.

**Springwood Ranch**

Project construction activities would result in soil impacts. Based on an estimate of 40 to 45 turbines, the total amount of ground disturbance during construction is estimated to be approximately 125 acres of total impact, of which 30 acres would be permanently impacted. Short-term erosion impacts would likely occur from clearing and grading activities during construction. During project operation, the risk of erosion would be similar to existing conditions on the site. Approximately 10 to 15 turbines could be located near areas of either high or moderate landslide potential. Setback and/or engineered protective measures would need to be required for these areas. Given the use of standard erosion control and stormwater management BMPs, erosion impacts would be localized, temporary, and insignificant.

Given the smaller number of turbines than proposed for the KVVPP, and the smaller project area, it is probable the amount of new access roads to be developed would also be smaller than for the KVVPP. The resulting amount of required fill would therefore probably be approximately half that required for the KVVPP. It is unknown if this amount of fill would be available on-site, or if would have to be imported from elsewhere in the County.

Development would have no influence on the level of seismic or volcanic hazard in the project area. A large earthquake in the project area could impact wind power operations, disrupt the regional electrical distribution system, damage wind power equipment, or cause collapse of the turbine towers. A volcanic eruption would contribute hazards from volcanic ash. Project design and implementation of emergency plans would minimize these potential impacts and protect the public health and safety and environment in the project vicinity.

Impacts of decommissioning would slightly alter topography and potentially cause minor erosion.

Table 1-3 continued.**Alternative****Impacts****Swauk Valley Ranch**

Project construction activities would result in soil impacts. Based on an estimated number of 42 turbines, the total amount of ground disturbance during construction is estimated to be approximately 97 acres of total impact, of which 53 acres would be permanently impacted. Total site disturbance and cut-and-fill activities in steep slope areas could result in significant erosion and some sliding of soil and alluvial materials. Soils and surface topography would not be altered after construction of the project is complete. Landscaping, grass, and other vegetative cover would prevent significant soil erosion during operation and maintenance of the project. A detailed SWPPP and site-specific BMPs would minimize the potential for pollutant discharge and erosion from the project site during construction and operations.

The total amount of fill that might be required for a project located on the Swauk Valley Ranch is estimated to be approximately 115,000 cubic yards.

Development would have no influence on the level of seismic or volcanic hazard in the project area. A large earthquake in the project area could impact wind power operations, disrupt the regional electrical distribution system, damage wind power equipment, or cause collapse of the turbine towers. A volcanic eruption would contribute hazards from volcanic ash. Project design and implementation of emergency plans would minimize these potential impacts and protect the public health and safety and environment in the project vicinity.

Impacts of decommissioning would slightly alter topography and potentially cause minor erosion.

**3.2 AIR QUALITY****Proposed Action**

Gasoline and diesel powered trucks, construction equipment, and processing equipment would generate carbon monoxide (CO), hydrocarbons, nitrogen oxides (NO<sub>x</sub>), and particulate matter in exhaust emissions. Construction would also create fugitive dust emissions from traffic and wind-blown dust from ground disturbances.

Odor emissions from the project are limited to odors associated with exhaust from diesel equipment and vehicles. Given the strong prevailing winds at the project site and the fact that the nearest houses are located several miles from the project site, no odor impacts are anticipated.

Operation of the project would produce no air emissions as no fuel would be burned to produce energy. It is anticipated that only a few trucks are required to travel along site roads for operation and maintenance activities. Therefore, operation of the project would not have any negative impact on air quality.

Operation of the project would generate minor amounts of fugitive dust. Project-related traffic on gravel access roads would generate small amounts of additional fugitive dust. Operational traffic is expected to consist mainly of commute vehicles and pickup trucks used for inspection and maintenance. The gravel roads serving the site would be maintained in good condition, thereby minimizing dust emissions.

Operation of the project would create no odors as no combustion is involved and no odor-producing materials are used in project operations.

Decommissioning operations would generate fugitive dust and tailpipe emissions similar to those generated during construction.

Table 1-3 continued.**Alternative****Impacts**

Impacts of the Kittitas Valley alternative would be similar to those described for the WHWPP due to the similarities in construction, operations, and maintenance activities. Construction would result in air pollution impacts generated by emissions from vehicle and equipment exhaust and fugitive dust particles from travel on paved and unpaved surfaces. Vehicle and equipment emissions would be temporary and limited to the immediate area surrounding the construction site. The magnitude of dust impacts would depend on the number of vehicles operated during construction and the distance over which transportation occurs. Dust emissions would also be associated with land clearing, ground excavation, and cut-and-fill operations. Project construction would produce limited odors from diesel equipment and vehicle exhaust; however, these impacts would occur over a short duration and would not result in adverse effects to regional air quality. With application of the standard control measures typically used in large construction projects, air quality impacts during construction would be insignificant.

Operation of the Kittitas Valley alternative would not result in significant air quality impacts, as it does not involve the combustion of fossil fuels to generate electricity. Project operations and maintenance activities would produce limited air pollutants related to vehicle emissions and fugitive dust. However, these impacts would be minimized through implementation of standard control measures and would not cause adverse effects to regional air quality.

**Kittitas Valley****Desert Claim***Similar to Proposed Action***Springwood Ranch***Similar to Proposed Action***Swauk Valley Ranch***Similar to Proposed Action***3.3 WATER RESOURCES****Proposed Action**

Precipitation during construction could result in sediment-laden surface runoff from disturbed areas that could adversely affect nearby surface waters. Encountering significant amounts of groundwater during construction and blasting activities is not expected. The overall impact is expected to be temporary and unlikely to affect wells in the project area.

Construction of the project would require water use for road construction, wetting of concrete, dust control, and other activities. The amount of water use is not expected to be significant because of the temporary nature of the impact and the availability of adequate water supply. An estimated 10.5 million to 10.8 million gallons of water would be used for various purposes during project construction.

No significant erosion or sedimentation impacts on surface waters are expected as a result of operation and maintenance of the project.

Water needs would be limited to bathroom and kitchen use, and general maintenance purposes and is expected to consume less than 1,000 gallons/day.

Potential impacts on water resources from decommissioning the proposed project would be similar to project construction.

Table 1-3 continued.**Alternative****Impacts****Kittitas Valley**

Impacts during construction could include sediment-laden surface runoff from ground disturbance and exposed soils. If not properly mitigated, runoff from disturbed areas could adversely affect nearby surface waters. Impacts to existing groundwater wells due to blasting for construction of turbine foundations is expected to be unlikely, because of the significant difference between the depth of existing water wells (57 to more than 720 feet, with most around 150 feet), and the comparatively much shallower turbine foundation depth.

Construction of the project would require delivery of water to the site. Estimated water use for construction related needs is 1 million gallons, with up to 6.4 million gallons required for dust suppression on access roads and roadways. Construction water would be imported from certificated off-site sources. Construction activities would not result in any adverse impacts on local groundwater. The overall impact on groundwater in the project area is expected to be temporary and unlikely to affect water wells.

Project O&M would result in no significant erosion or sedimentation impacts on local surface waters. Operation of the project would require a domestic well to serve the limited needs (less than 1000 gallons per day) of the O&M facility. No significant impacts on groundwater supplies are expected because of facility operations.

Because of the far removed location of the Kittitas Valley Site from floodplains, no impacts to flood plains from construction or operation are anticipated.

Impacts on water resources from decommissioning of the project would be similar to those described for construction. Appropriate construction BMPs followed during decommissioning activities would further minimize impacts.

**Desert Claim**

Turbine construction would affect six stream segments and temporarily disturb a total of 3.5 acres of stream and riparian area. Permanent impacts include tower foundations occupying 0.3 acre of riparian habitat and proposed access roads that cross 15 streams (eight would be crossed twice). The underground power-collection system would entail crossing 17 streams, each several times. The project would not require surface water withdrawals or diversions during construction or operation; impacts on surface water quantity and quality are expected to be minor and temporary. BMPs will be used during construction to address water quality impacts. The volume of water required during construction for dust suppression and construction operations was not quantified.

Impervious surfaces associate with the project are limited and are not expected to impact groundwater recharge. Impacts to existing groundwater wells due to blasting activities for turbine foundation construction are not expected.

Water supply for operation and maintenance (mainly at the project's O&M facility) would likely be provided through development of a domestic well on participating landowner's property with withdrawals less than 5000 gallons per day. Septic waste from the O&M facility would be routed to an on-site septic system constructed according to state and local government requirements.

Impacts on surface water and ground water during operation of the facility would therefore be minimal.

Impacts on water resources from decommissioning of the project would be similar to those described for construction. Appropriate construction BMPs followed during decommissioning activities would minimize impacts.

Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Springwood Ranch</b>	<p>Impacts during construction could include sediment-laden surface runoff from ground disturbance and exposed soils. If not properly mitigated, runoff from disturbed areas could adversely affect nearby surface waters. In particular, six to eight of the presumed turbine locations (and their associated access roads) would be within approximately one-quarter mile of the Yakima River, near slopes marked with high erosion and landslide potential. Additional site-specific mitigation measures would be warranted in this location of the project site. Site construction would have minimal impacts on groundwater. Runoff from disturbed areas would be infiltrated on site, resulting in a minor temporary increase in groundwater recharge.</p> <p>No analysis has been performed to determine the source or volume of water required during construction activities.</p> <p>Operation of a wind energy project would have minimal influence on existing surface water runoff patterns for Springwood Ranch and so would not result in significant impacts on surface water resources. Operation of the project would likely have minimal long-term impacts on groundwater. Impervious surfaces associated with turbines, roads, and buildings would result in a minor increase in surface runoff volume, some of which could translate into a minor increase in groundwater recharge. Water demands for project operation would likely be filled through construction of a domestic well.</p> <p>Impacts on water resources from decommissioning of the project would be similar to those described for construction. Appropriate construction BMPs followed during decommissioning activities would minimize impacts.</p>
<b>Swauk Valley Ranch</b>	<p>Impacts during construction could include sediment-laden surface runoff from ground disturbance and exposed soils. If not properly mitigated, runoff from disturbed areas could adversely affect nearby surface waters. Construction of the project would require delivery of water to the site for road construction, concrete preparation, dust control, and other activities. Construction activities would not result in any adverse impacts on local groundwater. The amount of water required would depend on the number of turbines and other facilities constructed, and the total length of access roads. Given that the hypothetical Swauk valley ranch project is smaller than the Wild Horse Project, the construction water needs would likely be less than those for the Wild Horse Project. The overall impact on groundwater in the project area is expected to be temporary and unlikely to affect water wells.</p> <p>Project O&amp;M would result in no significant erosion or sedimentation impacts on local surface waters. Operation of the project would require a domestic well to serve the limited needs of the O&amp;M facility. No significant impacts on groundwater supplies are expected because of facility operations.</p> <p>Impacts on water resources from decommissioning of the project would be similar to those described for construction. Appropriate construction BMPs followed during decommissioning activities would minimize impacts.</p>

**3.4 VEGETATION AND WETLANDS****Proposed Action**

Under the different design scenarios, the length or width of project components, including roads, substations, operation and maintenance (O&M) facilities, rock quarries, underground or overhead lines, permanent met towers, batch plant, or rock crusher would have the same footprints. These components remain unchanged under all scenarios and would have similar impacts under all scenarios.

Total temporary upland vegetation disturbance would range from 289.5 acres for the 104-Turbine/3 MW scenario to 401.4 acres for the 158-Turbine/1 MW scenario. Total permanent vegetation impacts would be very similar (165 acres), with 0.12-acre difference between scenarios.

The majority of impacts would occur within shrub-steppe vegetation, with herbaceous, herbaceous rock outcrop, rock outcrop, and pasture vegetation types also impacted.

Impacts associated with project operations would include shading from the turbine towers, increased dust generated by travel on graveled

Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
	<p>roadways, potential changes in fire frequency patterns, and potential introduction of invasive weed species.</p> <p>No wetlands would be impacted as a result of the Proposed Action. All areas disturbed by the project are potential habitat for noxious and invasive plant species, particularly for those species previously observed or known to occur in the project area.</p> <p>Because of the absence of known populations within the project area, no construction-related impacts are anticipated to any federally or state-listed endangered, threatened, proposed, or candidate plant species. Limited impacts are anticipated, however, to one species on the Washington State Review list, hedgehog cactus. Direct impacts to this species may occur where it is located in the project footprints and indirect impacts from habitat degradation are also possible. It's estimated that less than 10% of individuals in the project area would be impacted.</p>
<b>Kittitas Valley</b>	<p>Construction impacts to vegetation communities would be similar to those described for the Wild Horse site, except a greater diversity of habitats would be affected. There would be a permanent loss of approximately 93 to 118 acres of vegetation and temporary impacts to 311 to 371 acres. Grassland, shrub-steppe, sagebrush, deciduous shrub, riparian vegetation, and conifer forest communities would be cleared for project operations. Loss of 36–150 acres of sensitive lithosol habitat would occur. Disturbed areas would be replanted and restored after completion of construction activities, however, use of heavy equipment during the construction phase could cause soil compaction that may affect long-term plant survival and growth. Other potential impacts on vegetation include dust effects and increased potential for wildfires.</p> <p>Up to 185 square feet of one wetland would be affected by filling or grading activities during construction. The potential impacts to vegetation from the introduction, colonization, and spread of noxious weed species and the corresponding control measures would be similar to those described for the Wild Horse site.</p> <p>Impacts associated with project operations would be similar to those described for the Wild Horse site, and would include shading from the turbine towers, increased dust generated by travel on graveled roadways, potential changes in fire frequency patterns, and potential introduction of invasive weed species. No impacts on wetlands would occur during project operations if proper drainage, erosion-control plans, and stormwater management practices are implemented.</p> <p>There would be no direct impacts on endangered plant species during the construction or operation and maintenance phases of the project.</p>
<b>Desert Claim</b>	<p>Approximately 78 acres of existing shrub-steppe, grassland, riparian shrub, riparian forest, and wet meadow vegetation would be permanently removed with over 90% of the impact occurring in shrub-steppe and grassland. Approximately 3 acres of land currently used for agricultural purposes would also be permanently converted to land occupied by the project facility. In addition, 311 acres of vegetation would be temporarily disturbed.</p> <p>Approximately 9 acres of wetland area would be permanently displaced by project facilities, with an additional 16 acres temporarily disturbed by construction. No impacts to special-status plant species are anticipated. Similar to the Wild Horse site, all areas disturbed by project construction would be vulnerable to invasion by nonnative or noxious weed species. Control measures similar to those described for Wild Horse would be implemented.</p> <p>Impacts associated with operation and maintenance activities would be similar those described for the Wild Horse site.</p>
<b>Springwood Ranch</b>	<p>Impacts to vegetation communities would be similar to, but less than, those described for the Wild Horse site and the other alternatives. It is estimated that approximately 30 acres of existing vegetation would be permanently displaced with an additional 110 acres temporarily disturbed for construction. Grasslands (generally used for grazing now) and shrublands would be the vegetation communities most affected by the project. Portions of woodland in the northwest corner of the site could possibly be affected. No other plant communities would be temporarily or permanently disturbed.</p> <p>Construction of access roads and collection cable routes through or near wetland areas would potentially affect wetlands. Five wetlands lie in</p>

Table 1-3 continued.**Alternative****Impacts**

the northern and western portions of the site and would be subject to temporary disturbance by construction activity or displacement by permanent project facilities. Potential wetland impacts may be avoided or minimized through Micro-siting. The total area of potential wetland impacts has not been determined.

Based on current available information, no impact on federal or state threatened, endangered, or sensitive plant species would be expected to occur as a result of the project. All areas disturbed by the project are potential habitat for noxious and invasive species. Control measures would be implemented to prevent significant impacts.

Impacts from operation and maintenance activities would be similar to those described for the Wild Horse site.

**Swauk Valley Ranch**

Construction impacts would be similar to, but less than, those described for the Wild Horse and Kittitas Valley sites. Approximately 97 acres would be temporarily disturbed. Habitats that would be most affected by the project include grassland, shrub-steppe, and low sagebrush communities. Sensitive lithosol habitat would be potentially impacted in areas where shrub-steppe is disturbed. As with the project proposed at the Wild Horse site, these areas would be replanted and restored after completion of construction activities. Success of restoration efforts would depend on factors such as extent of soil compaction, extent of lithosols impacted, potential changes in fire frequency patterns, and the introduction of invasive plant species.

It is not known if there would be impacts to wetlands from construction. Micro-siting could reduce wetland impacts by placing project facilities outside wetland buffers. The project could potentially affect 17 acres of a thyme buckwheat/Sandberg's bluegrass plant community located adjacent to the south site boundary. As currently proposed, five wind turbines would be located within the designated sensitive area.

Impacts from operations and maintenance activities would be similar to those described for the Wild Horse site. No impacts on wetlands are anticipated during project operations if proper management practices are implemented.

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Table 1-3 continued.

Alternative	Impacts
<b>3.5 WILDLIFE</b>	
<b>Proposed Action</b>	<p>Potential construction-related impacts include clearing and removal of vegetation, modification or loss of habitat, and construction noise. Habitat for upland game birds, passerines, hawks, small mammals, deer, elk, and reptiles would be impacted. Depending upon the scenario constructed, there would be 289 acres to 401 acres of temporary impacts to wildlife habitat and approximately 165 acres of permanent impact to wildlife habitat</p> <p>Construction impacts to reptiles and amphibians on site would be loss of habitat and direct mortality of some individuals occurring in construction zones. Operation impacts would be limited. Temporary loss of big game habitat from project construction is considered a minor impact due to vegetation reclamation and the vast 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 again occupy areas on-site. Elk could shift their path to the north without migratory hindrance due to the large size of the corridor.</p> <p>Potential mortality from construction equipment on site is expected to be quite low and similar to other recent wind projects. Operation and maintenance impacts on wildlife species may include disturbance and fatalities associated with vehicle traffic, avoidance of turbines, and collisions with turbines and meteorological towers. It is expected that passerines, including western meadowlark, vesper sparrow and horned lark, may experience between 50 and 300 fatalities per year. Raptors such as American kestrels and red-tailed hawks are estimated to have an average of 3 to 6 fatalities per year. It is likely that some bat fatalities would occur from collision with wind turbines. No disturbance or displacement impacts to raptor nests are anticipated, since no active raptor nests were identified within ½ mile (0.80km) of the proposed facilities.</p> <p>A low risk potential exists for bald eagle fatalities during project operation. No impacts to federally-listed endangered, or threatened species are anticipated.</p> <p>Development of roads and project facilities may lead to fragmentation of habitat for big game populations. Impacts on mammals from project operations are expected to be very low and not significant. Some mortality of migratory bats, in particular hoary and silver-haired bats, is anticipated during operation.</p> <p>Some white-tailed and black-tailed jackrabbits and Merriam's shrew could be killed by vehicular traffic.</p>

Table 1-3 continued.

Alternative	Impacts
<b>Kittitas Valley</b>	<p>Potential construction-related impacts include clearing and removal of vegetation, modification or loss of habitat, and construction noise. Habitat for upland game birds, passerines, hawks, small mammals, deer, elk, and reptiles would be impacted. Depending upon the scenario constructed, there would be 231 acres to 370 acres of temporary impacts to wildlife habitat and 93 to 118 acres of permanent impact to wildlife habitat under this alternative.</p> <p>Ground-dwelling mammals would be temporarily displaced by construction activities and would lose the use of permanently disturbed areas. Elk and mule deer would likely avoid the project area during periods of construction activity. Reptile species (striped whipsnake and sharptail snake) may be affected by loss of habitat and direct mortality in construction zones.</p> <p>During project construction, the possibility of mortality effects to bald eagles is considered negligible and very unlikely to occur.</p> <p>Operation and maintenance impacts on wildlife species may include disturbance and fatalities associated with vehicle traffic, avoidance of turbines, and collisions with turbines and meteorological towers. It is expected that passerines may experience between 50 and 300 fatalities per year. Raptors are estimated to have an average of 3 to 6 fatalities per year. It is likely that some bat fatalities would occur from collision with wind turbines. Bald eagle use of this site is higher than that observed at the WHWPP site, however the potential for bald eagle mortality is considered low because of use patterns within the site and a lack of habitat features in the immediate vicinity of the proposed turbines.</p> <p>Individuals of some species such as white-tailed and black-tailed jackrabbits and Merriam's shrew could be killed by vehicular traffic. Development of roads and project facilities may lead to fragmentation of habitat for big game populations.</p>
<b>Desert Claim</b>	<p>Construction related impacts to wildlife habitat would be similar to those described for both the WHWPP and the Kittitas Valley alternative with, an estimated 311 acres of temporary impacts and 78 acres of permanent impacts to vegetation on the site. Construction activities could temporarily displace species from the project area due to noise and activity, and ground-dwelling species would be permanently displaced from areas of permanent impact. Construction activities could cause mule deer to avoid the project area however adequate habitat in the surrounding area would compensate for this. Elk may respond to project construction by shifting their migratory path to the north; the corridor is likely large enough to accommodate this adjustment without hindering their migration. During project construction, the possibility of mortality effects to bald eagles is considered negligible and very unlikely to occur.</p> <p>Operation and maintenance impacts would also be similar as those described for both the WHWPP and the Kittitas Valley alternative. Potential passerine mortality for this alternative has been estimated at approximately 140 to 220 birds per year and raptor fatalities have been estimated at approximately 3 to 4 per year. The potential for bald eagle mortality is low based on limited use of the site.</p> <p>Project operations may reduce use of the area by wintering mule deer, although it is expected that mule deer would become habituated to the turbines and reoccupy the site. Elk may also become habituated or may continue to use areas further to the north during migration.</p> <p>Individuals of some species may be killed by vehicular traffic.</p>

Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Springwood Ranch</b>	<p>Wind plant construction could possibly affect birds through loss of habitat, disturbance and displacement effects due to human presence, noise, and potential fatalities from construction equipment. Disturbance effects would be expected to occur only if the construction activity took place near an active nest or a foraging area. If this was the case, breeding might be affected and foraging opportunities altered during the duration of construction.</p> <p>Under this alternative it is estimated that there would be approximately 110 acres of temporary impact to vegetation and 28 to 30 acres of permanent impact to vegetation, therefore this alternative would have less impact to wildlife habitat than the WHWPP, and both the Kittitas Valley and the Desert Claim alternatives.</p> <p>Potential avian mortality has not been calculated for this alternative, and would be dependent upon the number of turbines built and the use of the area by avian species. Given the location of this site lower in the valley and closer to sources of water, fatality rates may not be comparable to either the WHWPP or the Kittitas Valley alternative, however baseline studies would be needed to determine this.</p> <p>Given the assumed higher incidence of bald eagle use of this site due to proximity to the Yakima River and known winter use sites, the potential for bald eagle mortality under this alternative would be greater than described for the WHWPP.</p> <p>Operation and maintenance activities could lead to avoidance of the area by mule deer, however it is possible that they would become habituated to the turbines and continue to utilize the area. Development would have little direct impact on elk, as there is little use of the site by elk and the riparian areas along the Yakima River and Taneum Creek would be protected by existing regulations. Deer impacts would likely include disturbance and displacement impacts from construction activity.</p> <p>Mortality of individuals associated with vehicular traffic may also occur.</p>
<b>Swauk Valley Ranch</b>	<p>Developing a wind plant on the Swauk Valley Ranch property would result in impacts on wildlife and habitat similar to those described for the Springwood Ranch Valley site. Given the close proximity of these sites and similarities in wildlife habitat between them, and assuming a project of similar magnitude was constructed, impacts would be expected to be similar. Since site-specific information for the Swauk Valley Ranch site is not available, however, potential impacts cannot be quantified.</p>

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**3.6 FISHERIES**

<b>Proposed Action</b>	<p>No streams or riparian areas would be impacted from construction disturbances related to wind turbines and roads. All project facilities would be located a considerable distance from streams and riparian areas.</p> <p>Precipitation during construction could result in sediment-laden surface runoff from disturbed areas that could adversely affect nearby surface waters.</p> <p>The quantity and quality of stormwater runoff could be affected by operation of the proposed project because of the increase in impervious surfaces, which could result in impacts on fisheries habitats downstream of the project area, if not mitigated.</p> <p>Impacts on fish and fish habitat from decommissioning the proposed project would be similar to project construction. Dismantling the project would reduce the quantity of impervious surfaces in the project area. No impacts from decommissioning are anticipated due to the absence of potential fish habitat in the proposed project area.</p>
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Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Kittitas Valley</b>	<p>As described for the WHWPP, potential impacts to fish would be limited to downstream impacts because there are no fish-bearing waters in the project area. Potential construction-related impacts to stream channels, water quality, and water quantity are expected to be short-term and negligible with proper management, including implementation of BMPs and other mitigation measures to control sedimentation and prevent water quality impacts that could potentially affect fish. Access roads associated with the project would cross and permanently disturb between 196 and 714 square feet in three stream channels, however all in stream work would be performed in accordance with a Hydraulic Project Approval (HPA) obtained for the project which would define requirements for erosion and sediment control and identify suitable work windows to minimize potential impacts. Adverse affects to downstream habitat, including the Yakima River are not expected to occur as a result of this alternative.</p> <p>Operation of the project would have no adverse impacts on fish and fish habitat in the Yakima River downstream of the project site assuming proper drainage, erosion control, and stormwater management practices are implemented.</p>
<b>Desert Claim</b>	<p>Because none of the streams in the Desert Claim project area are known to contain fish, potential impacts to fish are expected to be limited to downstream impacts, similar to both the WHWPP and the Kittitas Valley alternative. This alternative may have a slightly higher potential for impacts, however, due to the presence of Type 3 waters n the site, although these waters are not known to contain fish. As described for the WHWPP and the Kittitas Valley alternatives, BMPs and other mitigation measures to control sedimentation during both project construction and operations are expected to prevent water quality impacts that could potentially affect fish downstream of the project area.</p>
<b>Springwood Ranch</b>	<p>The Springwood Ranch alternative could have adverse affects on important fish habitat and on Endangered, Threatened, Sensitive and Priority Species in both the Yakima River and Taneum Creek. Construction-related impacts, primarily delivery of sediment to streams, would most likely exist even though required shoreline setbacks would avoid construction disturbance close to the streams. Some of the turbine locations near the top of steep slopes above the Yakima River or Taneum Creek have been identified as high erosion and/or landslide hazard areas, posing a risk of sedimentation. These physical conditions represent localized concerns for potential impacts to fish and fish habitat from construction disturbance, and might warrant site-specific mitigation measures in addition to the standard BMPs.</p>
<b>Swauk Valley Ranch</b>	<p>Since the Swauk Valley alternative lies in close proximity to Springwood Ranch and adjacent to the Yakima River, potential impacts of this alternative are likely to be similar to those described for the Springwood Ranch alternative.</p>

Table 1-3 continued.

Alternative	Impacts
<b>3.7 ENERGY AND NATURAL RESOURCES</b>	
<b>Proposed Action</b>	<p>Energy consumption during project construction or decommissioning would not require large volumes of fuel or electricity and would not significantly affect locally available energy resources. Project construction would require an estimated 150,000 gallons of diesel and 30,000 gallons of gasoline.</p> <p>Use of sand, gravel, steel, water and concrete would not have a significant effect on their supply in the area. Water would be acquired from a local supply with an estimated 10.5 million to 10.8 million gallons used during construction. Steel turbines would be constructed off site and trucked into the area, as would steel for turbine foundation reinforcements, and an estimated 12,000-14,000 tons of steel would be used in turbine construction and an additional 2,100-2,500 tons used for foundation reinforcement. Concrete, gravel, and sand and would be acquired locally with an estimated 30,000-36,000 cubic yards of concrete required; 244,300-246,900 cubic yards of gravel required; and 37,200-39,000 cubic yards of sand required.</p> <p>Project operation would have minimal demand for energy and natural resources. Operation and maintenance of the project would consume nonrenewable natural resources including fuel, electricity, water, lubricating oils, greases, and hydraulic fluids. The proposed action would use an estimated 11500 gallons of petroleum products per year. The project is expected to produce 67 aMW of electricity annually and it would be delivered to regional electric suppliers.</p> <p>The project would have little or no impact on the supply and price of electricity available to local consumers.</p>
<b>Kittitas Valley</b>	<p>Resources used in the construction of this alternative would be the same or similar to those used for the WHWPP since both are wind power plant construction projects. Project construction would use materials that require energy for their production. Energy (gasoline, diesel fuel, and electricity) would also be required to transport these materials to the project site and to operate construction equipment, with an estimated 25,000 gallons of diesel and gasoline consumed. Portable generators would produce the electricity required for construction activities. Other nonrenewable resources used in construction would include water, steel, concrete, and gravel (aggregate). During construction, an estimated 7 million gallons to 9 million gallons of water would be used; an estimated 11,000 to 13,000 tons of steel would be required to construct the turbines and towers with an additional 1,600 to 2,400 tons used for tower foundation reinforcement; 25,000 to 35,000 cubic yards of concrete would be consumed to build roads, crane pads, and turbine foundations; and 145,535 to 186,325 cubic yards of gravel (aggregate) would be required to construct roads, turbine and crane pads, and other project facilities. This is less than the estimated amounts of these materials that would be used under the proposed action</p> <p>Operation and maintenance of the project would consume nonrenewable natural resources including fuel, electricity, water, lubricating oils, greases, and hydraulic fluids and with the exception of petroleum products, the amounts of these resources used would be similar to the WHWPP. The Kittitas Valley alternative would use an estimated 8,500 gallons of petroleum products per year, which is less than the amount estimated for the WHWPP. The project would use the kinetic energy in wind and transform it by the wind turbine generators into electricity. The project would generate 60 aMW of electricity annually and would increase the availability of renewable energy in the Pacific Northwest. Electricity for project operations would mostly be generated by the project itself. During periods when the wind turbines are not generating electricity, power would be purchased from the regional utility.</p>
<b>Desert Claim</b>	<p>Specific data for energy and natural resource use is not available for this alternative, however the types of resources used would be similar to those used in the WHWPP and the Kittitas Valley alternative, since all are wind power plant construction projects. Based on this alternative having a maximum of 120 turbines, it is estimated that materials used would be in the mid-range of values described for the WHWPP, which would have 104, 136, or 158 turbines, depending upon the scenario selected. Operation and maintenance impacts on energy and natural resources would also be expected to be within the range described for the WHWPP. The project would generate 59 aMW of electricity annually and would increase the availability of renewable energy in the Pacific Northwest.</p>

Table 1-3 continued.

Alternative	Impacts
<b>Springwood Ranch</b>	Specific data for energy and natural resource use is not available for this alternative; however, the types of resources used would be similar to those used in the WHWPP and the Kittitas Valley alternative, since all are wind power plant construction projects. Based on construction of 40 to 45 turbines under this alternative, use of natural resources for construction, operations, and maintenance is expected to be less than the WHWPP, and the Kittitas Valley and Desert Claim alternatives. The project would generate 20 to 25 aMW of electricity annually and would increase the availability of renewable energy in the Pacific Northwest.
<b>Swauk Valley Ranch</b>	Specific data for energy and natural resource use is not available for this alternative, however the types of resources used would be similar to those used in the WHWPP and the Kittitas Valley alternative, since all are wind power plant construction projects. Based on estimated construction of 42 turbines under this alternative, use of natural resources for construction, operations, and maintenance is expected to be less than the WHWPP, Kittitas Valley, and Desert Claim alternatives and similar to the Springwood Ranch alternative. The project would generate 21 aMW of electricity annually and would increase the availability of renewable energy in the Pacific Northwest.
<b>3.8 NOISE</b>	
<b>Proposed Action</b>	<p>No noise impacts are expected from the construction of the project. The nearest residence is over 2 miles away from the project site and over 3 miles from the closest rock quarry.</p> <p>Noise generated by construction traffic is unlikely to cause any adverse impact. Commute vehicles and up to 49 heavy trucks per hour would cause traffic noise levels to exceed FHWA impact thresholds only at homes within 60 feet of the street centerline.</p> <p>No noise impacts are expected from the operation and maintenance of the project. Noise from wind turbines, transmission lines, traffic, and vibration effects are expected to be less than background at the nearest resident.</p> <p>Noise impacts are unlikely to cause any adverse impact.</p>
<b>Kittitas Valley</b>	<p>Noise generated by construction equipment is expected to vary, depending on the construction phase, but would not be expected to substantially impair nearby residential land uses. Temporary blasting noise impacts would be associated with construction of the wind turbines. Construction vehicles traveling on local roadways and other nearby roads would temporarily increase noise levels.</p> <p>Modeling of a major wind power generation facility at this site comparable to the WHWPP indicated the potential for significant noise impacts (EFSEC, 2004). Noise levels during project operations could exceed regulatory limits at several homes nearest the WTG strings. Changes in background noise levels at numerous other homes could be perceived as adverse depending on the magnitude of that change and the nature of the receptor. Minor increases in traffic along U.S. 97 and project access roads during project operations would not be expected to generate substantial adverse noise effects. The project would not result in any significant impacts from groundborne vibration.</p>
<b>Desert Claim</b>	<p>During construction, there would be temporary increases in sound levels near active areas of construction and along roadways used for construction vehicles, depending on the type of equipment being used and the amount of time it is in use.</p> <p>Predicted operational noise levels at all receptor locations would meet applicable noise limits. Based on noise level and/or increase over ambient levels, project noise impacts would be rated either low or medium, and would not be significant.</p>
<b>Springwood Ranch</b>	Several residences are within approximately 500 feet of one or two turbine locations in the northwestern corner of the Springwood Ranch layout. Construction impacts at the closest homes would include temporary increases in sound levels near active areas of construction and along roadways. The closest residences could be subject to operational noise in excess of the 50-dBA limit, and/or noise level increases of about 10 dBA. It is possible that the proposed project might result in significant noise impacts to these residences unless the turbines in question were relocated or eliminated.

Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Swauk Valley Ranch</b>	<p>Noise generated by construction equipment is expected to vary, depending on the construction phase, but would not be expected to substantially impair nearby residential land uses. Temporary blasting noise impacts would be associated with construction of the wind turbines. Construction vehicles traveling on local roadways and other nearby roads would temporarily increase noise levels.</p> <p>Noise levels during project operations could exceed regulatory thresholds. Changes in background noise levels could be perceived as adverse depending on the magnitude of that change and the nature of the receptor. Minor increases in traffic along U.S. 97 and project access roads during project operations would not be expected to generate substantial adverse noise effects. The project would not result in any significant impacts from groundborne vibration.</p>
<b>3.9 LAND USE</b>	
<b>Proposed Action</b>	<p>Potential direct impacts of the proposed WHWPP would include conversion of rangeland to utility-related uses and the temporary removal of livestock from the project site during construction activities. The permanent footprint of the project will remove approximately 165 acres from open space and grazing uses for the life of the project (at least 20 years). Construction would necessitate temporary displacement of cattle from 290 acres to 401 acres of grazing land, which may or may not be available following construction. At a maximum, the removal of approximately 8,600 acres of land from the approximately 445,000 acres of pasture or unimproved grazing land in Kittitas County would represent a reduction of 1.9%.</p> <p>No permanent land use impacts are expected to result from decommissioning.</p>
<b>Kittitas Valley</b>	<p>Potential direct impacts of the proposed KVVPP would include conversion of rural lands to utility-related uses and potential displacement of livestock.</p> <p>Project construction would temporarily alter 231 to 371 acres of land, temporarily interfering with existing rangeland uses and grazing operations. Cattle or other livestock would need to be removed from the most intensive construction areas.</p> <p>Construction activities could affect the use and enjoyment of recreational activities such as hunting and hiking in the project area.</p> <p>During operation, existing rangeland and grazing uses could resume throughout most of the project area.</p>
<b>Desert Claim</b>	<p>During construction of the wind turbines and associated facilities, land uses within the project area would continue, although some land would be temporarily disturbed. During operations, 82.4 acres, or 1.6%, of the project area would be used for wind farm facilities and infrastructure (i.e., the permanent project footprint).</p> <p>Overall, direct impacts to recreational resources and opportunities would be very low or negligible. Most current recreation activity within the project area, which consists of (at most) limited informal use, would be able to resume at current levels during operation and maintenance. During operation, hunting would not be permitted to avoid possible damage to turbines or other project facilities. Because project area lands are not managed for recreation, loss of this limited opportunity would not be a significant recreation impact.</p>
<b>Springwood Ranch</b>	<p>Approximately 30 acres of grasslands would be converted to wind energy facility use, with existing grazing activity being temporarily displaced or disturbed. Wind turbines would be greater in scale than nearby rural residential uses, but are not more intensive than other resource activities in terms of noise and land use impacts. The overall direct effect of the project on land use patterns is not likely to be significant because wind production is generally seen as compatible with rural resource uses. In addition, the project would not attract supporting land uses, generate more development, significantly increase traffic, or increase demand for commercial, industrial, or housing services nearby.</p>

Table 1-3 continued.

Alternative	Impacts
<b>Swauk Valley Ranch</b>	Potential direct impacts include conversion an estimated 165 acres of rural lands to utility-related uses. This permanent conversion of rangeland uses to wind energy production would result in an unavoidable impact. Construction activities could temporarily interfere with existing rangeland uses and grazing operations. Cattle or other livestock would need to be removed from the most intensive construction areas. Construction activities could affect the use and enjoyment of recreational activities such as hunting and hiking in the project area. Some wind turbines may be visible from I-90 and portions of the John Wayne Trail.

**3.10 VISUAL RESOURCES/LIGHT AND GLARE**

<b>Proposed Action</b>	
	<p>Large earth moving equipment, trucks, cranes, and other heavy equipment will be highly evident features in views toward the project site from nearby areas. At some times, small, localized clouds of dust created by road building and other grading activities may be visible at the site.</p> <p>Close-at-hand views, limited to those from nearby segments of Vantage Highway, of activities will be moderately to highly visible and will have a moderate level of visual impact. However, these impacts will be temporary due to the short-term nature of construction.</p> <p>The units with the greatest numbers of viewers with middle ground views of the project site, (i.e., the areas to the south and west), are areas in which construction activities will not be visible because they will be hidden behind the ridgeline formed by Whiskey Dick Mountain. From vantages with background views of the site, the visual effects will be relatively minor and will have little or no impact on the quality of views.</p> <p>The project would be marked according to guidelines established by the Federal Aviation Administration's (FAA's) aircraft safety lighting requirements which call for lights that flash white during the day and red at night. These lights are designed to concentrate the beam in the horizontal plane, thus minimizing light diffusion down toward the ground and up toward the sky. Based on experience at the operating Staline and Nine Canyon wind power projects in Washington, it appears that the white flashing lights would be visible and likely to create a moderate or high level of visual impact. The flashing red lights associated with the project would introduce a new element into the project area's nighttime environment. These lights would be limited in number, red, and directional with little potential to create skyglow<sup>1</sup> or backscatter. The flashing red lights associated with the WHWPP would be most noticeable in areas within roughly 1 mile of the project. No residences or public residences are within this area.<sup>2</sup></p> <p>At the O&amp;M facility and substation(s), outdoor night lighting will be required for safety and security. The project's O&amp;M facility and substation(s) will create sources of light in areas where there are currently no nighttime sources of light. Mitigation measures will be implemented to restrict the substation and O&amp;M facility lighting to the minimum required and to attenuate its effects.</p> <p>The project is not expected to result in any shadow flicker effects on any sensitive receptors, such as residences, because the distance of more than 9,000 feet to the nearest residence is well beyond the distance at which shadow flicker can cause impacts.</p>

<sup>1</sup> Skyglow is a brightening of the night skies caused by light that is projected upward and then reflected back toward the ground by the atmosphere.

<sup>2</sup> Backscatter is related to skyglow; the term refers to the reflection of light back toward the ground by moisture or dust in the atmosphere.

Table 1-3 continued.**Alternative****Impacts****Kittitas Valley**

During construction, large earthmoving equipment, trucks, cranes, and other heavy equipment would be highly visible from nearby areas. The visual changes associated with construction activities would have a moderate to high visual impact. Areas disturbed during construction would be restored on project completion. Some construction activities may occur during evening or nighttime hours, and lighting may be needed.

The project has the potential to create high levels of visual impact at several locations. Overall, visual impacts from this alternative would be greater than for the WHWPP due to proximity to a greater number of residences and views from a greater number of high use roads and scenic areas.

Turbines would be visible from US 97 and on the ridgetops throughout the project vicinity.

Impacts from light and glare would be similar under this alternative as described for the WHWPP but would be expected to be greater due to the proximity of the Kittitas Valley alternative to high use roads and a larger number of residences than the WHWPP.

During project construction, double shifts may be necessary, which would in turn necessitate night lighting of the construction site, which would be visible from roads and residences. This would be temporary and short term impacts.

Impacts from operations and maintenance would occur primarily in association with lighting required by the FAA.

Night lighting of project facilities would increase nighttime illumination in the vicinity, potentially impacting views from roads and residences.

The potential for impacts from glare would depend largely on materials used; however, glare would be minimized by using a low-reflectivity finish on all turbines.

**Desert Claim**

Visual changes associated with construction and operation of the Desert Claim Wind Power Project would have temporary but moderate visual impacts on nearby residences and roads. During construction (approximately 9 months), equipment, clouds of dust, and exposed soils would create temporary visual impacts.

Under this alternative, visual impacts would range from low level to high level, with the majority being low-level impacts.

Visual impacts from this alternative are likely to be less than the WHWPP and the Kittitas Valley alternatives due to it not being visible from the Columbia River Gorge as compared to the WHWPP, and greater distance from major transportation routes such as I-90 and US-97 and fewer residences in close proximity than the Kittitas Valley alternative.

Impacts from light and glare under the Desert Claim alternative would be similar to those described for the WHWPP but greater due to closer proximity to residences. Wind turbines along the perimeter of this alternative would have dual lighting systems to meet FAA safety requirements.

Night lighting of project facilities would also contribute to increased night lighting in the project area.

Blade glare or glint may also occur occasionally, and this can be seen over distances of 6 to 9 miles.

Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Springwood Ranch</b>	<p>Visual impacts associated with construction would have a temporary but moderate visual impact on views from nearby residences and roads in the Thorp Prairie area. The construction-related visual impact from more distant viewpoints would be low.</p> <p>The Springwood Ranch project would have significant visual impacts during operation. This alternative would be highly visible from I-90, with turbines located in middle-ground views and breaking the skyline, with similar impacts to views from SR 10 and the Thorp Highway. Overall, development of a wind farm on Springwood Ranch would significantly change the aesthetic character of the local landscape, especially as viewed from I-90, and high level impacts would be expected.</p> <p>The required aviation marking lights would result in significant additional impacts on nearby residents and passing motorists.</p> <p>Security lighting at the O&amp;M facility and the project substation would have minimal impact on the nighttime visual environment if it were tied to motion sensors. Blade glint or glare from sunlight reflecting off moving blades could possibly be an annoyance to eastbound drivers on I-90 late in the day.</p>
<b>Swauk Valley Ranch</b>	<p>Impacts to visual resources under this alternative would be similar to those described for the Springwood Ranch alternative, with both construction activity and operating turbines visible from I-90, SR10, and from nearby residences. Although information from individual viewpoints is not available for this alternative, it is expected that high level impacts would result from construction of this alternative due to its location.</p> <p>Impacts from light and glare would also be similar to those described for the Springwood Ranch alternative.</p>

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**3.11 POPULATION, HOUSING, AND ECONOMICS**

<b>Proposed Action</b>	<p>The project would employ an estimated 250 workers during construction and 14 to 18 during operations. There would not be a noticeable impact on the population in Ellensburg or Kittitas County.</p> <p>No houses would be moved or destroyed; therefore, there would be no direct impacts on housing.</p> <p>Temporary housing would be needed for non-local workers during construction of the project. Based on supply and vacancy rates, impacts are not expected to be significant.</p> <p>Spending on labor and materials would result in an additional 71 full and part-time jobs during construction. Total labor income during construction would be approximately \$4.8 million.</p> <p>Economic impacts during operations would include about \$1.4 million in labor income.</p> <p>It is expected that the project would result in both increased revenues for state schools and local public services in the area, as well as reduced property tax levy rates for local taxpayers.</p> <p>Decommissioning impacts include a long-term loss of employment and associated economic activity for the local and regional economy, and a loss of tax base.</p>
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Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Kittitas Valley</b>	<p>The project would create approximately 253 new temporary jobs during construction, with a short-term peak estimated at 160 construction workers. Operation of the proposed project is expected to require up to 20 full-time employees. One half of the permanent employees are expected to be resident workers from the County, resulting in long-term benefits to overall County employment.</p> <p>Temporary housing would be needed for non-local workers during construction of the project. Based on supply and vacancy rates, impacts are not expected to be significant.</p> <p>Total income (direct, indirect, and induced) generated during the construction phase of the project is estimated to be more than \$5.7 million (in 2002 dollars) in the County, a temporary but beneficial effect to the County economy. The project would generate an increase of \$1,249,600 in annual property tax revenue to the County, in addition to other fiscal benefits, such as increased sales and use taxes, license and permit fees, and charges for services.</p> <p>The local affects of wind power project development on property values at the Kittitas Valley Alternative would be as described for the proposed Wild Horse project.</p> <p>Decommissioning impacts would be similar to those described above for the Proposed Action.</p>
<b>Desert Claim</b>	<p>In general, most of the potential population, housing, and economic impacts for the Desert Claim Alternative would be similar to, but less than, those described for the Proposed Action above. Because the workforce required for construction (150 workers) and operation (10 workers) of the project would be relatively small (in the context of total county-wide economic activity), the project is not expected to significantly impact population, housing, or employment throughout the County.</p> <p>Total labor income during construction is estimated to be over \$3.8 million. Together, potential corporate profits, property rents, and net interest are estimated at over \$1.5 million. This alternative is expected to indirectly generate minor amounts of sales tax revenue.</p> <p>Impacts on economics within the County during operation of the Desert Claim Alternative are estimated at \$0.9 million in labor income and \$2 million in other value added annually. Potential property tax revenues from the Desert Claim Alternative are estimated at a maximum of nearly \$1.1 million for the first year of operation.</p> <p>Decommissioning impacts would be similar to, but less than, those described above for the Proposed Action.</p>
<b>Springwood Ranch</b>	<p>Impacts from construction of the Springwood Ranch Alternative on population, housing, and economics would be similar to, but less than, the Proposed Action described above. The project would employ an estimated 150 workers during the construction phase. Non-local workers would most likely seek temporary housing during construction, and impacts are not expected to be significant. Spending on labor and materials would indirectly result in additional jobs, and total labor income would increase during the construction phase.</p> <p>Operation of the proposed project is expected to require 10 full-time employees. Economic impacts during operations would include an estimated \$315,000 in labor income and \$700,000 in other value added per year.</p> <p>Decommissioning impacts would be similar to, but less than, those described for the Proposed Action above because this alternative would be a smaller project overall.</p>

Table 1-3 continued.

Alternative	Impacts
<b>Swauk Valley Ranch</b>	<p>The temporary population impacts from worker relocation and in-migration needed to meet project labor demands of the Swauk Valley Ranch Alternative would be similar to the Springwood Ranch Alternative and relatively minor. Construction jobs created by the project would result in short-term benefits to overall County and regional employment. Operation of the proposed project is expected to require between 12 and 20 full-time employees, resulting in long-term benefits to overall County employment.</p> <p>Decommissioning impacts would be similar to, but less than, those described for the Proposed Action above because this alternative would be a smaller project overall.</p>
<b>3.12 PUBLIC SERVICES AND UTILITIES/RECREATION</b>	
<b>Proposed Action</b>	<p>Construction activities would not directly affect any existing recreation facilities, as there are no such facilities in or adjacent to the project area. Recreational visitors using the nearby WDFW wildlife areas or the Ginkgo Petrified Forest State Park facilities might notice construction activities on the site or project-related construction traffic and might be subject to occasional traffic delays or detours. Existing recreational use of the project area is limited to hunting with the specific permission of the current landowner, and would presumably be displaced to the extent that the construction period coincided with hunting seasons. Some hunting activity could be allowed during the operating period. If hunting were displaced, it would constitute a minor loss of recreational opportunity.</p> <p>Construction activities could result in increased calls for fire and emergency medical services. Potential needs for fire service during construction and operation would likely result in the execution of a service contract with a rural fire district (either Fire District 2, based in Ellensburg, or Fire District 4 in Vantage).</p> <p>During operations, impacts to fire and emergency medical services would not be significant. Current Fire District No. 2 resources would be sufficient to provide fire suppression services to the project area, although staff are not trained for high-angle rescues.</p> <p>Project-related demands for police would be minimal and no significant adverse impacts on existing services would be expected.</p> <p>No significant impacts on local schools are anticipated during construction or operation.</p> <p>No significant impacts would occur to water supply, stormwater, or sewer facilities.</p> <p>No significant impacts are anticipated on solid waste, energy, or communication facilities.</p>
<b>Kittitas Valley</b>	<p>Potential direct impacts of the proposed KVVPP would include potential conflicts between the project and onsite and offsite recreation activities, and increased demand for park and recreational resources.</p> <p>Project construction could temporarily increase the risk of fire at the project site and in the broader project area. Fire risks during construction would be similar to those described for the Proposed Action, although fire hazards could be slightly more at the Kittitas Valley Alternative due to poor access along a portion of Hayward Hill Road that could hinder responders. Construction activities could result in additional calls for law enforcement agencies for traffic and accident related events, theft, or vandalism.</p> <p>Impacts to schools are not anticipated during the construction phase under this alternative. Demand for EMS could increase slightly due to construction related accidents that could occur at the project site or vicinity. Demand on water would increase, with an approximately 2 to 5 million gallons consumed for dust suppression and other construction purposes. The Ryegrass Landfill and Greater Wenatchee Regional Landfill would be impacted slightly by the increased amount of solid waste generated at the Kittitas Valley Alternative site.</p> <p>Impacts on local schools, EMS, water supply, wastewater disposal, and communications are expected to be minimal during the operation phase of the project since sufficient capacity exists in the area to meet the demands.</p>

Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Desert Claim</b>	<p>Impacts to recreational resources and opportunities would be very low or negligible, generally limited to some temporary audible and visual intrusion and congestion along roadways.</p> <p>Calls for fire response to the project area could increase during construction and would be similar to those described for the Proposed Action and Kittitas Valley Alternative. Project construction could contribute to an increased risk of accidental fire. The Desert Claim Alternative is not expected to have more than a slight potential increase in the demand for law enforcement over existing conditions. Impacts on local schools would be the same as that described for the Proposed Action. Impacts to public water supply, stormwater, and sewer services are not anticipated since these services are not available on-site. It is also anticipated that the local landfills would be able to accommodate the level of solid waste and debris generated by the project.</p> <p>During operation, impacts to fire and emergency medical services would occur to a lesser extent than those described for the construction period. The project area lands are not managed for recreation, and incidental use within the project area would be able to resume at current levels during operation and maintenance. Hunting would not be permitted.</p>
<b>Springwood Ranch</b>	<p>Impacts of the Springwood Ranch Alternative on public services, utilities, and recreation would be similar to those described for the Proposed Action. Potential needs for fire service during construction and operation would likely be addressed by a service contract with Fire District 1, based in Thorp.</p> <p>It is anticipated that project-related demands for police, education, solid waste disposal, and communications services would be limited or minimal on existing service systems. Needs for water supply, stormwater management, and sewer service would be addressed internally through project construction and operation plans and would have minimal impacts on existing delivery systems for those utility services.</p>
<b>Swauk Valley Ranch</b>	<p>Demands on public services, utilities, and recreational facilities would be similar to, but likely less than, those described for the Proposed Action and the other alternatives due to its smaller size. Construction activities could potentially result in additional calls for fire response and law enforcement. As with any construction site, the demand for EMS could increase due to the potential for construction related accidents.</p> <p>Project-related demands on schools, water supply, sewer and solid waste disposal, recreational parks, and communication services would also be less than those described for the Proposed Action.</p>

**3.13 CULTURAL RESOURCES**

<b>Proposed Action</b>	<p>Direct construction impacts on cultural resources would likely be minimal or nonexistent. No project facilities coincide with the locations of inventoried cultural sites.</p> <p>Mitigation measures would ensure that potential impact on cultural resources in the project area during construction activities would be minimized. If a tribe requested to have one of their representatives present during earth-disturbing construction activities, the Applicant would comply with their wishes.</p> <p>No direct impacts on any known cultural resources would occur during normal operation and maintenance of the project. There would be no increase in the potential for disturbance and/or removal of artifacts from cultural resource sites</p> <p>Impacts associated with the decommissioning of the WHWPP would be similar to those described above for construction impacts. Potential impacts to archaeological or historic sites would be mitigated as described for construction activities.</p>
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Table 1-3 continued.**Alternative****Impacts****Kittitas Valley**

Ground-disturbing activity during construction could potentially affect the two prehistoric archaeological sites within the project area. These archaeological sites should be avoided during construction to prevent any damage to either of them. Mitigation measures would ensure that potential impact on cultural resources in the project area during construction activities would be minimized, and that appropriate state and Tribal agencies would be contacted if any sites were uncovered during construction, and the sites and artifacts adequately protected. No direct impacts to any known cultural resources would occur during normal operation and maintenance of the project.

Tribal consultation is ongoing to determine whether significant resources, such as areas important in Yakama or Colville history or cultural and religious practices, would be indirectly affected by the project. Tribal Nations would be contacted prior to all ground-disturbing activities and invited to have representatives present during these activities.

No direct impacts on any known cultural resources would occur during normal operation and maintenance of the project. There would be no increase in the potential for disturbance and/or removal of artifacts from cultural resource sites

Decommissioning the project at the end of its useful life also poses the potential for further impacts if decommissioning activities stray beyond the perimeters of the pre-existing disturbance zones used during construction.

**Desert Claim**

Potential direct impacts to documented cultural resources have been identified based on the proposed layout of project facilities relative to the locations of the known resources. Any cultural resources within or very close to the area of temporary construction disturbance around the various project facilities would presumably be subject to direct impacts. A map analysis (which is not documented in the EIS because the locations of the cultural sites are confidential and not appropriate for disclosure) indicates that six identified cultural resource sites would experience unavoidable adverse impacts associated with turbine, access road and collection system construction if the project facilities were sited according to the current design.

Measures such as clearly marking areas that need to be avoided to protect sensitive resources and ensuring that project personnel observe those markings and their associated restrictions could minimize the potential for indirect impacts such as increased opportunities for removal of artifacts.

The proposed project is not expected to cause access-related indirect impacts to cultural resources because the degree of public accessibility to cultural resources within the project area would be less with the project than it is at present.

The prospects for avoiding cultural sites would be addressed in the final micro-siting of wind turbines and other project facilities, which would occur during final design and prior to construction.

No additional mitigation would be necessary if all identified cultural resource sites were avoided in the final layout and construction of project facilities. If final placement of the project elements resulted in unavoidable adverse impacts to a significant resource, then mitigation would be required to retrieve the scientific and historical information that makes the site significant. Appropriate mitigation measures should be tailored to the specific circumstances of the resource and developed in consultation with the Washington State Historic Preservation Officer (SHPO). If the affected resource is prehistoric, then the SHPO would require consultation with all affected Native American tribes of the Mid-Columbia River Basin.

No direct impacts on any known cultural resources would occur during normal operation and maintenance of the project. There would be no increase in the potential for disturbance and/or removal of artifacts from cultural resource sites

Decommissioning the project at the end of its useful life also poses the potential for further impacts if decommissioning activities strayed beyond the perimeters of the pre-existing disturbance zones used during construction.

Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Springwood Ranch</b>	<p>Construction activities could destroy artifacts or structures or disturb relationships among artifacts and their context; however, it is not known how many of the seven identified resources would be subject to direct impacts from project construction. Because one of the cultural resources is a prehistoric trail that reportedly crossed through the middle of the property, it is possible the trail route would intersect multiple elements of a wind energy project on this site. The two prehistoric resources and the historic resources associated with railroad and irrigation activities are likely to be located near the Yakima River and would not likely be subject to direct impacts. Indirect impacts to cultural resources would primarily involve changes to the visual context of the resources and to a number of the 30 cultural resources that have been identified in the area surrounding the Springwood Ranch. In this hypothetical scenario, any affected Tribal Nation would be notified prior to ground disturbing activities, and would be invited to have representatives present during such activities.</p> <p>No direct impacts on any known cultural resources would occur during normal operation and maintenance of the project. There would be no increase in the potential for disturbance and/or removal of artifacts from cultural resource sites</p> <p>Decommissioning the project at the end of its useful life also poses the potential for further impacts if decommissioning activities stray beyond the perimeters of the pre-existing disturbance zones used during construction.</p>
<b>Swauk Valley Ranch</b>	<p>No recorded archaeological sites are located within the boundaries of the Swauk Valley Ranch site; however, eleven recorded sites are known to exist within a 1-mile radius of the site. Ground-disturbing activity during construction could potentially uncover prehistoric archaeological sites. Mitigation measures would ensure that potential impacts on cultural resources in the project area during construction activities would be minimized. No direct impacts to any known cultural resources would occur during normal operation and maintenance of the project. In this hypothetical scenario, any affected Tribal Nation would be notified prior to ground disturbing activities, and would be invited to have representatives present during such activities.</p> <p>No direct impacts on any known cultural resources would occur during normal operation and maintenance of the project. There would be no increase in the potential for disturbance and/or removal of artifacts from cultural resource sites</p> <p>Decommissioning the project at the end of its useful life also poses the potential for further impacts if decommissioning activities stray beyond the perimeters of the pre-existing disturbance zones used during construction.</p>

Table 1-3 continued.

Alternative	Impacts
<b>3.14 TRAFFIC AND TRANSPORTATION</b>	
<b>Proposed Action</b>	<p>The project construction period requiring the transportation of major equipment and constituting the highest amount of construction traffic would span approximately 6 months. Vantage Highway would be the primary roadway to and from the project site. Potential short-term impacts resulting from the construction of access roads include potential delays or detours necessitated by construction activities on or adjacent to county roads. Transporter Route 1 would experience an additional 171 peak-hour trips during the peak of construction (107 worker trips, 49 heavy-duty delivery trips, and 15 light-duty delivery trucks). Transporter Route 2 would experience very little additional construction traffic at only 7 peak-hour trips. The LOS during the PM peak hour with construction worker traffic and delivery traffic causes some reduction in the LOS level.</p> <p>Construction activities could require temporary road modifications to accommodate trucks transporting tower components; could cause damage to road surfaces from transport of components or construction materials; and could lead to interruptions to general traffic flow resulting from detours or delays. An approved Transportation Management Plan would include measures to minimize impacts of construction-related traffic.</p> <p>Project operation would generate a negligible volume of traffic that would not affect existing levels of service on public roads. The level of future tourist activity and traffic cannot be specifically predicted, but could be safely accommodated with signage, off-road parking and viewing opportunities, and vehicle maneuvering space.</p> <p>Because the project would be further from I-90 it is anticipated that relatively few travelers would leave the freeway to take a close look at the facility.</p>
<b>Kittitas Valley</b>	<p>Project construction would take approximately 1 year. Construction traffic would utilize primarily U.S. 97, I-90, and the Kittitas County road network. The total number of vehicles during the construction peak would be 180 (160 vehicles for worker traffic and 20 vehicles for light-duty delivery). Construction traffic would result in an increase in total PM peak volumes on all road segments. Under the Kittitas Valley alternative the LOS for I-90 and US 97 south of Bettas Road would not change but it would go from C to D for US 97 north of I-90 and from A to B for both Bettas and Hayward Roads during construction. Construction traffic impacts would be mitigated with appropriate traffic-control procedures approved by WSDOT. Construction-related parking would be located at the O&amp;M facility and along the site access roads. Three temporary project access points from U.S. 97 would be established. An approved Transportation Management Plan would include measures to minimize impacts of construction-related traffic.</p> <p>Wind turbine components would need to be transported along state highways from a larger metropolitan area such as Seattle. Trucks delivering construction equipment and materials to the project site would exceed the WSDOT legal load limit, requiring special permits to be issued for vehicles exceeding the state's maximum size, weight, and load limits. Proper road signs and traffic management procedures would be utilized to prevent traffic disruptions from construction activities and slow or oversized, wide truckloads.</p> <p>Increases in traffic could result in an increase in the accident rate on roads in the project area. This would be minimized through implementation of an approved Transportation Management Plan.</p> <p>Project operations and maintenance could generate up to 40 workers commuting to and from the O&amp;M facility on paved state and county roads during a 24-hour period. This is not expected to affect LOS on roads in the project area such that LOS would be different than if the project wasn't built. Employees would park at the O&amp;M facility parking lot, with no more than 25 vehicles parked at the facility at any one time. The proposed O&amp;M facility parking lot may not be sufficient to accommodate future parking needs of both project employees and potential visiting tourists. The project applicant would be responsible for maintenance of turbine access roads, access ways, and other roads built to construct and operate the project. There would be no public access to project facilities on privately owned land during construction, operations, and maintenance.</p>

Table 1-3 continued.**Alternative****Impacts****Desert Claim**

Potential construction impacts include additional traffic generated by construction workers, delivery of construction materials, and transport of wind turbine components that would be assembled on-site. Potential short-term impacts resulting from the construction of access roads would be potential delays or detours necessitated by construction activities on or adjacent to county roads. Under this alternative, construction traffic is expected to result in an increase in PM peak traffic of 80 trips, which would not alter the level of service on roads in the project area. Construction related parking would be located on the project site.

Construction activities could also require temporary modifications to intersections of county roads to accommodate trucks transporting tower components, and damage to road surfaces may result from transport of components or construction materials. Construction traffic impacts would be mitigated through the development and approval of a construction Traffic Management Plan that would address transportation and access concerns during the construction period.

The traffic directly associated with project operations and maintenance would not impact existing levels of service on public roads in the project vicinity.

Some of the proposed turbine locations within the Desert Claim project area would conflict with the protected airspace associated with the existing visual-flight-rules (VFR) traffic pattern, although the conflict involves operation by a category of aircraft that use Bowers Field on a very rare basis. The airspace conflict could be resolved, and the potential operations impact could be avoided by modifying the project plan to remove or relocate turbines and/or to install smaller turbines in selected locations or changing the airport operating procedures to employ a right-hand VFR traffic pattern for two of the four runways at Bowers Field.

**Springwood Ranch**

Due to the very low existing traffic volumes, the traffic generated by construction would not affect level of service on local roads in the project area and there would be few opportunities for slow-moving trucks delivering turbine components to delay local traffic. Potential impacts of construction include degradation of the road surface caused by trucks delivering tower components. In addition, the delivery of turbine components might be difficult due to the physical constrictions of the Elk Heights interchange and the adjacent intersection of Elk Heights Road and Thorp Prairie Road. The Thorp Prairie Road has numerous horizontal and vertical curves that might be problematic for transporters with low clearances. Increases in traffic could result in an increase in accidents in the project area. These issues would be addressed in a Transportation Management Plan prepared for the project.

Trips generated by on-site workers present during operation would not affect the existing level of service at local intersections. The wind towers would be closer to I-90 compared to the WHWPP, Kittitas Valley, and Desert claim alternatives, and it is anticipated that some travelers on I-90 would leave the freeway to take a closer look at the facility. In order to avoid tourists making U-turns on county roads with narrow or no shoulders, it would be necessary to construct a turnaround and small off-road parking area at a suitable viewpoint on Thorp Prairie Road where interpretive information could be included.

A detailed evaluation of potential airspace conflicts has not been completed. However, based on the locations, it does not appear that a wind energy project at the Springwood Ranch site would interfere with air traffic or airspace at either Bowers Field or the Cle Elum Municipal Airport.

Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Swauk Valley Ranch</b>	<p>Construction traffic impacts would be similar to those described for the Springwood Ranch alternative. Most construction traffic would travel to the site using I-90, SR 10, and the Kittitas County road network. Construction-related parking would be located at an appropriate, designated area or along site access roads. Temporary access points from State or County roads may need to be established. A Transportation Management Plan will be prepared to minimize impacts of construction-related traffic.</p> <p>Wind turbine components would need to be transported along state highways from a larger metropolitan area such as Seattle. Trucks delivering construction equipment and materials to the project site would exceed the WSDOT legal load limit, requiring special permits to be issued for vehicles exceeding the state's maximum size, weight, and load limits. Proper road signs and traffic management procedures would be utilized to prevent traffic disruptions from construction activities and slow or oversized, wide truckloads.</p> <p>Trips generated by on-site workers present during operation would not affect the existing level of service at local intersections. The wind towers would be closer to I-90 compared to the WHWPP, Kittitas Valley, and Desert claim alternatives, and it is anticipated that some travelers on I-90 would leave the freeway to take a closer look at the facility. A site-specific plan to accommodate this activity would need to be developed as part of the Transportation Management Plan for this alternative.</p>

**3.15 HEALTH AND SAFETY**

<b>Proposed Action</b>	<p>Fire is the primary health and safety risk at the site, especially during the hot, dry summer season. Fires could be started by lightning strike or by human activities.</p> <p>Unintentional or accidental fire or explosion risks during project operations and maintenance include human activities such as cigarette smoking, use of vehicles off established roadways, and mechanical malfunction inside the wind turbine generators and at other project facilities.</p> <p>Potential sources of hazardous materials include fuel and oils from construction equipment and mineral oil used to fill substation transformers during project operations. Periodic changing of lubricating oils and hydraulic fluids used in the individual wind turbine generators would result in the generation of small quantities of hazardous waste.</p> <p>Potential safety risks during project operations include ice falling off of rotating turbine blades, blade throw (blade fragments thrown from a rotating turbine), and potential collapse of turbine towers.</p> <p>Shadow-flicker caused by wind turbines (alternating changes in light intensity when the moving turbine blades cast shadows on the ground and objects) is not expected to result in health effects since the closest resident is located 1.75 miles from the nearest turbine in residential areas.</p> <p>Health and safety decommissioning impacts for all off-site alternatives would be similar to construction impacts.</p>
<b>Kittitas Valley</b>	<p>The types of health and safety impacts possible would be the same for all action alternatives.</p> <p>The project proponent would develop and implement a fire protection and prevention plan for both construction and operation activities, in coordination with the Kittitas County Fire Marshal and other appropriate agencies.</p> <p>Hazardous materials spills would be addressed in accordance with a project SPCC Plan.</p> <p>Shadow flicker impacts were evaluated for 17 residences in vicinity of the project. Although three residences would be exposed to lengthier shadow flicker effects, it was determined that the exposure would not result in health effects for the residents.</p> <p>Health and safety decommissioning impacts for all off-site alternatives would be similar to construction impacts.</p>

Table 1-3 continued.

<b>Alternative</b>	<b>Impacts</b>
<b>Desert Claim</b>	<p>The types of health and safety impacts possible would be the same for all action alternatives.</p> <p>The proponent would implement recommendations received from the Kittitas County Fire Marshal to mitigate fire hazards in the project area. Hazardous materials spills would be addressed in accordance with a project SPCC Plan.</p> <p>Shadow-flicker caused by wind turbines is not expected to result in health effects in residential areas. Of 45 receptors, 38 would experience varying degrees of exposure to shadow flicker. Micro siting some turbines was determined as a possible mitigation measure to reduce exposure of some receptors.</p> <p>Health and safety decommissioning impacts for all off-site alternatives would be similar to construction impacts.</p>
<b>Springwood Ranch</b>	<p>The types of health and safety impacts possible would be the same for all action alternatives.</p> <p>Because the Springwood Ranch alternative is an overall smaller proposal, with less turbines, and less miles of access roads, it may present a lower fire and explosion risk during both construction and operation. Hazardous materials spills would be addressed in accordance with a project SPCC Plan.</p> <p>Detailed analyses of potential shadow flicker impacts were not performed for the hypothetical layout for the Springwood Ranch alternative. It is expected that, based on the hypothetical layout, some residences on the eastern edge of Sunlight Waters would be exposed to shadow-flicker (based on a 2,000-foot distance threshold).</p> <p>Health and safety decommissioning impacts for all off-site alternatives would be similar to construction impacts.</p>
<b>Swauk Valley Ranch</b>	<p>The types of health and safety impacts possible would be the same for all action alternatives.</p> <p>Because the Swauk Valley Ranch alternative is an overall smaller proposal, with less turbines, and less miles of access roads, it may present a lower fire and explosion risk during both construction and operation. Hazardous materials spills would be addressed in accordance with a project SPCC Plan.</p> <p>Detailed analyses of potential shadow flicker impacts were not performed for the hypothetical layout for the Swauk Valley Ranch alternative. It is expected that, based on the hypothetical layout some residences concentrated along the Yakima River and to the south of the proposed site could be exposed to shadow-flicker (based on a 2,000-foot distance threshold).</p> <p>Health and safety decommissioning impacts for all off-site alternatives would be similar to construction impacts.</p>

## **1.7 Cumulative Impacts**

Although the environmental impacts of proposed power projects are typically evaluated on an individual basis, the recent number of wind power generation applications in Kittitas County has prompted EFSEC to consider potential cumulative impacts. Furthermore, SEPA requires consideration of cumulative impacts. The Wild Horse, Kittitas Valley, and Desert Claim wind power projects are three similar but independent developments being proposed in Kittitas County that are being permitted through separate review processes— Wild Horse and Kittitas Valley through EFSEC and Desert Claim through Kittitas County. The Kittitas Valley and Desert Claim projects are relatively close to each other (within 1.6 miles at the closest point), while the Wild Horse Project is 14 miles from the Desert Claim project and 21 miles from the Kittitas Valley project. A brief description of the Desert Claim and Kittitas Valley projects is provided in Section 3.16, “Cumulative Impacts.” Potential cumulative impacts associated with the Wild Horse, Kittitas Valley, and Desert Claim wind power projects are addressed in Section 3.16 for each resource topic, and are summarized below. Potential impacts associated with population growth within Kittitas County are also considered.

### **1.7.1 Earth Resources**

Significant cumulative impacts on soil, topography, and geology resulting from construction of the three proposed wind power projects and future population growth in Kittitas County are not anticipated. Impacts on earth resources from development of the three wind power projects would generally be confined to localized, temporary erosion impacts from ground disturbance during construction. The intensity of impacts on near-surface soils would be within the construction footprint for the respective project and would not be overlapping in geographic extent.

Cut and fill would be required to construct access roads, tower foundations, transformer pads, and other project facilities. Each project will require large amounts of gravel for road and foundation construction; however, because the Wild Horse Project will utilize on-site rock pits to supply gravel, the cumulative impact on local resources will be reduced.

Similarly, development associated with population growth within the County would result in localized impacts from ground disturbance and cuts and fills for infrastructure, support services, and housing assuming construction follows prescribed engineering standards and requirements. Future agricultural activities are not anticipated to appreciably affect earth resources.

### **1.7.2 Air Quality**

Development of wind power sites would result in production of vehicle exhaust and fugitive dust emissions, potentially exacerbating current air quality problems in Kittitas County. This would occur in areas of existing agricultural use which are common sources of exhaust and dust emissions.

While gravel for construction of the WHWPP would be obtained on-site, gravel needed for construction of the Kittitas Valley and Desert Claim projects would be transported from offsite sources. This activity could result in a temporary increase in localized cumulative air quality

impacts on travel routes shared by the two projects. This potential impact would be greatest if construction activities for the Kittitas Valley and Desert Claim projects overlapped and occurred during periods of peak winds.

The air emissions from contemporaneous construction of multiple wind projects would be additive in terms of their contribution to total regional pollutant loads. However, it is not anticipated that the incremental impact of the aggregated air emissions from construction of multiple wind power projects would be sufficient for regional air pollutant concentrations to temporarily exceed the applicable air quality standards.

Development associated with population growth in the County would result in an incremental increase in exhaust and dust emission from construction and operation of infrastructure and housing and resultant increases in vehicular traffic. It is not anticipated that the incremental impact would be sufficient for regional air pollutant concentrations to exceed applicable air quality standards.

### **1.7.3 Water Resources**

Cumulative effects to surface water resources could result from increases in the amount of impervious surfaces that in turn could alter the amount and quality of drainage to area creeks and other water features. However, because the three projects are sufficiently distant from each other and are located in different tributary watersheds, there would not be combined effects from multiple projects on the same stream. The localized effects of each project would occur within the drainages of minor tributaries to the Yakima River and the Columbia River and at a distance of at least several miles upstream from either river. Specific cumulative impacts on groundwater resources from the three wind power projects would depend on the characteristics of common aquifers to which the three proposed wind power project sites are hydrologically linked.

Because the three project sites are sufficiently distant from each other and are located in different tributary watersheds, there would not be a combined effect from multiple projects on the same aquifer. Therefore, significant cumulative effects on water resources within the Upper Yakima River basin or the northeastern portion of the Kittitas Valley are not expected.

Development associated with projected population growth in the County would result in an incremental increase in water demand within urban and rural areas. The projected operational water demand for the three wind projects would have a negligible effect on water quantity conditions for surface water and ground water resources since the projects would have minimal demands for water consumption.

### **1.7.4 Vegetation and Wetlands**

Implementation of all three proposed wind power projects would result in the loss of vegetation through clearing and ground disturbance, including the potential loss of lithosols, a unique habitat often associated with the shrub-steppe region. The combined figures for the three projects amount to approximately 336 total acres of existing vegetation lost, including approximately 170 acres of shrub-steppe and approximately 100 acres of lithosol habitat. This constitutes an approximately 2% loss of vegetation at each project site (out of the 17,000 collective acres for the three wind power project sites), which would not be considered an adverse cumulative effect. The precise regional extent of lithosol habitat is not quantitatively

known. Therefore, it is difficult to assess the specific magnitude of cumulative lithosol impacts at the three wind power project sites within the context of the surrounding region.

No federally listed rare plants were identified at either the Kittitas Valley or Wild Horse project sites. One Washington State listed species, hedgehog cactus, was found extensively in lithosolic habitats at the Wild Horse Project site, but less than 10% of the individuals identified during a rare plant survey are considered at risk from direct impact from the Wild Horse Project.

No rare plants protected by either the federal or state governments were found in searches of the areas of likely disturbance in the Desert Claim project area (Kittitas County 2003a). The minimal potential impacts of the proposed wind projects on rare plants would not represent a significant cumulative impact on any species.

Cumulative impacts of the three proposed power projects on wetlands could result from directly filling or grading of wetland systems, as well as from indirect effects caused by stormwater runoff, increased pollutant loading, and water quality degradation. This in turn could result in loss of wetland diversity and reduced wetland functions and values. The Kittitas Valley project would disturb between approximately 135 and 185 square feet of one small potential wetland system at the project site. Construction activities would temporarily disturb approximately 16 acres of wetland area at the Desert Claim site, while the permanent project footprint would overlap with an area estimated at 9 acres.

No wetlands were identified within a 164-foot buffer around the planned locations for Wild Horse Project facilities; therefore, no impacts on wetlands are anticipated for that project. The collective effects of these projects would be minor as a result of wetland avoidance and/or required mitigation for wetlands that could not be avoided, and are not expected to extend to downstream surface waters or wetlands. Therefore, there would not be a potential for significant cumulative effects on wetland resources.

Development associated with population growth (6,976 additional people by 2020) would result in an incremental reduction in native plant communities and cultivated lands in the County. In addition, an unknown level of conversion of native plant communities to cultivated agriculture is likely to occur in the Kittitas Valley and in the vicinity of the Wild Horse project site. The proposed projects and future residential development within the County will create the potential for the introduction of or the spread of noxious weeds into cultivated and native plant communities.

### **1.7.5 Wildlife**

Some temporary displacement of wintering mule deer and elk is anticipated from winter construction activities in the three wind projects. If tolerance thresholds during wind power project maintenance activities are exceeded, some animals are likely to be displaced and use areas away from the wind project development areas. However, cumulative impacts on wintering mule deer and elk for all projects are expected to be low.

The estimated combined raptor mortality rate for the three wind power projects would be approximately 14 raptor fatalities per year with 361 combined turbines, and 15 raptor fatalities per year with 391 combined turbines. Given the distances between the Wild Horse, Kittitas Valley, and Desert Claim projects, and the typical home ranges of the raptors at risk for collision at the

three projects, the same individual breeding raptors that use the Kittitas Valley and Desert Claim project areas are not expected to use the Wild Horse Project area.

The cumulative impacts on bald eagle winter habitat from all projects would be small. During project operation, bald eagles that occupy the area near the Yakima River would be at some risk for collision with turbines. Assuming risk of collision is proportional to use, one bald eagle fatality between the Kittitas Valley and Desert Claim projects might occur every two to three years. There was no observed use at the Wild Horse Project area.

It is expected that passerines would make up the largest proportion of bird fatalities for the three projects combined. Based on the mortality estimates from other wind projects studied, combined passerine mortality for the three projects would range from 430 to 740 fatalities per year. This level of mortality is not expected to have any population-level consequences for individual species.

Using mortality estimates from other operating wind projects (one to two bat fatalities per turbine per year), total annual bat mortality for all three wind power projects in Kittitas County is expected to range from 361 to 782 bat fatalities. However, the significance of bat mortality from the three projects is hard to predict because there is very little information available regarding the size of bat populations. Studies suggest, however, that resident bats do not appear to be significantly affected by wind turbines (Johnson et al. 2003; Gruver 2002) because nearly all observations of fatalities were during the fall migration period.

Population growth within Kittitas County would also result in an incremental decrease in wildlife habitat in the County, primarily within rural and designated municipal Urban Growth Areas.

### **1.7.6 Fisheries**

None of the affected streams in the project area are known to contain fish communities. Development of the Desert Claim project would result in minor disturbance or displacement impacts on streams and riparian zones in the project area. Site-specific BMPS would be utilized on all sites to avoid potential downstream impacts. The effects of the three projects would be minimal in three localized areas of Kittitas County and would not extend to downstream waters; therefore there would not be a potential for significant cumulative effects on fishery resources.

Development associated with population growth may result in an incremental impact to fish habitat in the County. Development scheduled to occur within rural and designated municipal Urban Growth Areas would result in increased impervious surface area and resultant modification to stream flows. Development affecting stream resources will be subject to critical areas regulations.

### **1.7.7 Energy and Natural Resources**

When combined with other planned wind projects in the region, construction activity associated with the Wild Horse Project would contribute to local energy demands. The combined demands of the three projects for fuel and construction materials would cumulatively contribute to the local and regional demand for, and irreversible expenditures of, nonrenewable resources on a temporary basis.

The three proposed wind power projects would provide a combined nameplate capacity of approximately 565 MW of electricity (under the most likely scenario for development of the Kittitas Valley and Wild Horse projects). Assuming long-term operation of the three projects at a typical wind power project capacity factor of 33%, combined they would produce approximately 186 (average) MW of electricity on a long-term basis. That collective energy output would represent a substantial increase in the amount of electricity currently produced within Kittitas County. Operation of the three projects would also cumulatively add to the capacity, production, and availability of renewable energy sources in Washington State and the greater Pacific Northwest, although it would represent a relatively small addition to the total regional electricity supply.

Development associated with population growth within the County would result in demand for energy and natural resources for the construction of infrastructure, support services, and housing. These impacts would include the use of petroleum products, wood, steel, and sand and gravel.

### **1.7.8 Noise**

Construction noise generated by the three wind power projects would be temporary in nature and would primarily be from operation of construction equipment and vehicles. The magnitude of this temporary cumulative impact would depend upon the timing of construction activities, but any adverse effects would be limited to the area immediately surrounding each construction site.

The Kittitas Valley and Desert Claim projects are a sufficient distance apart that residents near either of the projects would likely only hear the noise from one of the project sites. Noise modeling results for both projects indicate that receptors located between the two projects would be unlikely to experience noticeable increases in noise levels as a combined effect of project operations. Given the distances that separate the Wild Horse Project from the Desert Claim and Kittitas Valley sites, Wild Horse Project operations would not contribute to cumulative noise impacts in the region.

Development associated with population growth within the County would be expected to result in localized and incremental increases in the sources of noise and background noise levels. Short-term increases in noise levels would occur with construction of infrastructure, and housing. Longer term noise increases would occur as development occurs in urbanizing areas. These noise increases would be confined to specific locations.

### **1.7.9 Land Use**

The three wind power projects would be located on approximately 17,966 acres used primarily for agricultural activities (grazing and rangeland), representing approximately 4% of the Ag-20 and Forest and Range zoned land in the County. Existing uses and activities would not be displaced by proposed wind power facilities, but would collectively result in the long-term conversion of approximately 330 acres of agricultural land as a result of construction of the wind power facilities.

Individually or collectively, the proposed projects would not likely attract supporting uses or generate spin-off development and the relatively low number of full-time employees (30 to 42) would not create cumulative demand for services or create pressure to change or convert existing

land uses. Residential development in the vicinity of the Wild Horse site is less likely to occur than at Kittitas Valley and Desert Claim sites because of the relatively remote location.

### **1.7.10 Visual Resources**

The cumulative effect of the Wild Horse project would occur in the context of landscape modifications associated with past, current, and future land uses in the project vicinity. The local landscape at the Wild Horse site has some evidence of change resulting from agricultural practices, but less than do the Kittitas Valley and Desert Claim sites which include more intensive agricultural practices, infrastructure facilities, and rural residential development.

Because the Wild Horse project would be located so far from the other two projects and in an entirely different portion of the landscape it would have limited potential to be seen in the same view as the other two projects, however there may be some viewpoints in or near Kittitas Valley from which all three projects would be visible.

In addressing the potential cumulative visual impacts of multiple wind power projects, it is most important to consider the Desert Claim and Kittitas Valley projects together because of their proximity. Should both the Kittitas Valley and Desert Claim projects be built, the visual consequences would include approximately 240 wind turbines (120 for each project) on the valley floor and adjacent slopes in the north-central portion of the Kittitas Valley. There are a number of locations where the Desert Claim project could be seen in the foreground to middle ground and the Kittitas Valley project could be seen in the middle ground to background.

The overall effect of multiple wind energy projects on the regional landscape and the experience of viewers when considered over time and at multiple locations is also a consideration. For example, drivers traveling west through Kittitas County on I-90 would likely notice the Wild Horse project from both east of the Columbia River and again in the eastern end of the Kittitas Valley and could subsequently view a more extensive area of wind turbines to the north and west of Ellensburg (the Desert Claim and Kittitas Valley projects). Travelers would be likely to recall having seen a collection of wind turbines a few minutes before seeing more wind turbines. This progressive realization could leave the impression with some viewers that wind turbines are plentiful in Kittitas Valley. This type of impression would also occur for residents of and frequent visitors to the local area.

Development associated with population growth within the County would result in both localized and landscape-scale changes in visual resources. These changes will occur from the changes in land use with the construction of infrastructure, support services, and housing to support the population increases.

### **1.7.11 Population, Housing, and Economics**

The proposed projects could contribute to increases in temporary and permanent job opportunities and populations in the region. The majority of cumulative population and housing impacts would be temporary and would occur during construction. Assuming that all three projects are constructed simultaneously, temporary population increases resulting from construction work forces could result in cumulative effects to the local housing supply. However, given the rental housing supply and the vacancy rate, it appears that the study area has an

adequate supply of temporary housing to accommodate the potential cumulative increase in construction workers from outside the area.

Projected population growth in the county (6,976 additional people by 2020) would increase the demand for housing, infrastructure, and support services. The estimated number of fulltime workers for the three projects (30 to 42) would represent less than 1% of the anticipated population growth in the county.

The three wind power projects would increase retail sales and overall economic activity in the area, as well as employment opportunities for residents of Kittitas County. The three projects would also increase the amount of annual property tax revenue to the affected taxing districts in Kittitas County,

### **1.7.12 Public Services/Utilities and Recreation**

Concurrent development of the three projects could create additional demand for law enforcement, fire protection, and emergency medical service response during both construction and operations and maintenance phases. The level of impact would depend on the timing of concurrent construction activities as well as the availability of emergency response resources at the time of an incident.

Increased permanent worker populations required to operate the three proposed wind farms could contribute to increased cumulative demands for school services in central and eastern Kittitas County. However, local residents would likely fill a portion of the operations jobs and it is unlikely that all of the in-migrants would locate in the same school district. Therefore, no significant cumulative adverse impacts on schools are anticipated from project operation.

The proposed wind energy projects would result in the maintenance of existing recreational activities with the project areas. Some access interruptions or temporary congestion might occur during project construction, particularly in the Desert Claim and Kittitas Valley project areas.

The impacts of these three projects, in association with general population growth in the county, would not result in significant cumulative impacts to recreation.

Cumulative impacts on utility service providers would consist primarily of cumulative increases in the demand for solid waste disposal services. However, this increased demand is not anticipated to be significant with respect to either collection capability or the capacity of the County's construction and demolition waste disposal site. No long-term cumulative impacts on regional water and wastewater treatment plants are anticipated because water and wastewater demands would be limited to temporary needs generated during construction activities and those from operations and maintenance staff.

No significant cumulative impacts on electricity or telecommunications are anticipated. Based on the distances between residences and the respective project facilities, there does not appear to be a potential for cumulatively significant interference impacts on radio and television reception in the areas near the proposed wind power projects.

Temporary population increases associated with construction workers from all three projects could cumulatively increase demand for and use of local and regional recreation resources during overlapping construction periods, but those are not expected to be significant.

### 1.7.13 Cultural Resources

Constructing the three proposed wind power projects would result in ground disturbance that could potentially impact identified and unidentified prehistoric and/or historic sites, as well as cause impacts on traditional cultural properties. Cultural resource surveys have been conducted at each of the project sites. Direct and indirect impacts to cultural resource within these sites would occur within the context of comparable impacts from past and ongoing land uses in the vicinity. Agricultural activities, irrigation development, construction of roads and power transmission lines, and rural residential development have no doubt disturbed or destroyed cultural resources that existed in the vicinity of these projects, and have altered the historic setting for the resources that remain. Tribal representatives of the Yakama Nation have expressed concern about the cumulative effect from wind power projects. Efforts to bring together wind farm applicants, government agencies, and tribal representatives to discuss these and other issues of concern are ongoing. Currently, archaeological monitoring along the Schultz-Wautoma transmission line project has identified sensitive cultural resources within the project's area of potential effect. Cultural resource information gathered during this phase of archaeological monitoring along the Schultz-Wautoma transmission line project will be incorporated into the Final EIS.

### 1.7.14 Transportation

If construction occurs simultaneously for the Kittitas Valley and Wild Horse projects, the segment of I-90 immediately west of Exit 106 (to US 97) may temporarily carry construction traffic for both projects. The combined construction traffic volumes of both the Kittitas Valley and Wild Horse projects during the PM peak would cause this segment of I-90 to operate at level-of-service (LOS) B. This is acceptable by county and State standards, and it is anticipated that the LOS would return to its original condition (LOS A) once the projects are completed.

With the addition of the Desert Claim project, the total peak-hour trips if all three proposed projects were under construction simultaneously would result in an operating condition that is still within the numerical range for LOS B. Therefore, the additive effect of the potential Desert Claim construction traffic would not result in a significant cumulative impact on the operating condition for I-90 during the construction period. However, if turbine components or offsite gravel materials were delivered to multiple projects at the same time, there could be increased delays or additional detours within the area near the Desert Claim and Kittitas Valley projects.

Development of multiple wind farms in the Kittitas Valley area would likely result in a larger total number of tourists visiting wind project facilities, relative to the level of activity with a single project. However, the tourist traffic would likely be localized to the individual areas around the projects and would not likely be additive or cumulative.

Aircraft operations in the Kittitas Valley are centered at Bowers Field. Given its location, the proposed Desert Claim project would represent a cumulative addition to natural and constructed features within the Bowers Field airspace. Twenty seven of the proposed turbines would intrude into the protected airspace for Bowers Field. The Kittitas Valley and Wild Horse projects would not present potential conflicts with air traffic operations at Bowers Field or other facilities and there would be no cumulative significant impacts to air transportation resulting from development of those projects.

### **1.7.15 Health and Safety**

The potential for exposure to fuel and non-fuel hazardous substances would increase, particularly during the construction period if construction periods were to overlap. However, the effects would be localized in the area of the spill.

The greatest fire risk for each project would occur during the construction period, because of the level of activity and the numbers of workers and equipment active at that time. The greatest cumulative fire risk would occur if and when construction schedules for two, or all three, of the projects overlapped. With implementation of strict fire protection and prevention measures, the cumulative risk of potential fires associated with construction of the three proposed wind turbine projects should be minimized.

Certain fire risks specific to wind energy projects would also exist during the operating period for each project. However, specific measures to counteract or manage these risks would be implemented during project operation. For example, the project facilities would be continually monitored, the project areas would be regularly patrolled, and access to the project areas would be limited. Therefore, the concurrent operation of the three proposed wind power projects would not likely pose a cumulatively significant increased fire risk.

Site-specific health and safety concerns associated with wind energy production include the potential for ice to be thrown from rotating blades, blades to disengage and be thrown from the tower, and tower collapse during extreme weather conditions. These potential health and safety impacts from the three projects would be localized and would not be expected to be cumulatively significant.

Potential shadow flicker impacts from the three proposed wind power projects would be limited to the immediate vicinity (approximately 2,000 feet) of the wind turbines within each respective project area. Some residences that are close to turbine locations for the Desert Claim or Kittitas Valley projects would be subject to shadow flicker for varying numbers of hours per year. These impacts would be limited to a number of discrete locations that are well separated from each other, and would not constitute a cumulative impact from these two proposed projects.

The electric and magnetic fields associated with the three proposed wind power projects would be less than those produced by electrical facilities already present in the vicinity of the respective project areas, and would diminish to background levels at distances within which public exposure could occur. Therefore, there would not be cumulative exposure impacts from development of multiple wind energy projects.

## **1.8 Issues to Be Resolved**

Although most of the issues associated with this proposal have been clearly identified and assessed, or would be addressed in some clearly defined action plan in the future, there are some that have not been totally resolved or that may require further analysis. The following unresolved issue will require further evaluation and decision by the Applicant and EFSEC.

### **1.8.1 Compliance with Local Land Use Plans and Zoning Ordinances**

The proposed project is not presently in compliance with local land use plans and zoning ordinances. As of the date of issuance of this Draft EIS, EFSEC has directed the Applicant to make application for change in, or permission under, Kittitas County land use plans and zoning ordinances and to make all reasonable efforts to resolve the noncompliance. In the event the Applicant's efforts fail to achieve compliance, the Applicant could request that the state preempt such plans and ordinances pursuant to Chapter 463-28-040 WAC.

## **1.9 Significant Unavoidable Adverse Impacts**

The Applicant has mitigated several potentially significant adverse impacts associated with the proposed action during the preliminary design phase of the proposed WHWPP. However, even with implementation of mitigation measures proposed by the Applicant, in conjunction with additional mitigation included in this EIS, the following have been identified as potential significant unavoidable adverse impacts of the proposed action:

### **1.9.1 Wildlife**

It is currently not clear what indirect impacts the project may have on big game winter range and big game movements. It is anticipated that the mitigation (exclusion of livestock from springs) and elimination of grazing on the mitigation parcel will improve big game habitat. Controlled access and controlled hunting on the site will allow WDFW to properly manage the herds, which should eliminate the potential for creating a refuge for big game and minimize stress to big game in the winter. The level and effect of disturbance impacts on big game from maintenance operations is not known, and may or may not be significant.

### **1.9.2 Noise**

Haul truck traffic during construction would cause high noise levels at homes near the roads being used to access the site. Peak-hour traffic noise would likely exceed FHWA's noise impact criteria at homes within 75 to 150 feet of the haul route. Although temporary in nature, these traffic noise levels would be adverse and unavoidable.