Chapter 2 Proposed Action and Alternatives

2.1 Proposed Action

BPA proposes to execute one or more power purchase and transmission services agreements to acquire and transmit up to the full electrical output of SeaWest's proposed Condon Wind Project (49.8 megawatts [MW]). The proposed wind project is described in the following sections.

2.1.1 Project Overview

The proposed project would consist of a wind project and its associated electrical system. The project would use modern, efficient 600-kilowatt (kW) wind turbines to convert energy in the winds near Condon, Oregon, to electricity that would be transmitted over the BPA transmission system. The proposed project would be sited entirely on private agricultural land northwest of the town of Condon in Gilliam County, Oregon. The project would consist of one or two phases: the first phase would use 41 wind turbines to yield a capacity of approximately 24.6 MW. A second phase (if built) would use 42 wind turbines to yield a capacity of approximately 25.2 MW. The first phase is proposed for construction in late 2001; the second phase could be constructed during spring/summer of 2002 or later. For purposes of this EIS, the size of the project is assumed to be 49.8 MW, built in two phases, and the potential effects of a project of that size are evaluated.

Major components of the wind project include wind turbines and foundations, small pad-mounted transformers, an operation and maintenance (O&M) building, power collection and communication cables, project access roads, meteorological towers on foundations, and a substation. During construction there would also be temporary equipment storage and construction staging areas. The proposed siting of wind turbines, roads, power lines, or other facility-related construction may be adjusted based on environmental, engineering, meteorological, or permit conditions.

2.1.2 Project Location and Project Site

The project site is located on both sides of Highway 206 (ORE206), approximately 5 miles northwest of the town of Condon in Gilliam County, Oregon. The 38-acre project site lies within a 4,200-acre study area (see Figure 2.1-1) consisting of gently sloping plateaus and rolling, arid hills traversed by shallow canyons. In general, the elevation of the project site and study area ranges from approximately 2,400 feet to 3,300 feet.

Within the project site, the wind project facilities would occupy a permanent footprint of approximately 21 acres for the 24.6-MW first phase and an additional 17 acres for the second phase (38 acres total). The project has been designed to locate the turbines on the relatively flat (and predominately cultivated) tops of plateaus to take advantage of the best wind resources while minimizing potential environmental impacts.

The project site consists of private farmland that is used for non-irrigated agriculture (primarily winter wheat and barley), cattle grazing, or land that is in the Conservation Reserve Program (CRP). The General Plan for Gilliam County, and the implementing zoning regulations, designates the project site as "Exclusive Farm Use." Facilities for generating electricity from wind energy can be permitted in Exclusive Farm Use zones pursuant to a conditional land use permit. Such a permit would be issued by Gilliam County, in accordance with county procedures.

2.1.3 Wind Resource

The project site is well exposed to the winds in all directions; however, the prevailing winds blow from the southwest and northwest across the project site toward the east. The winds are expected to be strongest from late fall through spring.

Historical wind data collected near Wasco, Oregon; Goodnoe Hills, Washington; and Kennewick, Washington, indicate that the Condon area has sufficient winds for wind project development. Currently, three temporary meteorological towers are measuring wind data at the project site to confirm the wind resource potential.

2.1.4 Project Components

2.1.4.1 Turbines

The potential locations of turbines are shown in Figure 2.1-2. On wind energy projects such as the proposed project, sufficient spacing is maintained between the turbine towers to reduce the impact of a given row of turbines (called a string) on the quality of the wind resource available to the row or rows downwind of it. For the proposed project, a spacing of approximately 460 feet would be maintained between the turbine towers within each string. Downwind spacing between the strings would be maintained at between 1,500 to 2,200 feet.

2.1.4.2 Project Access Roads

Access to the project site would be directly from Highway 206 (ORE206) onto project access roads located on private farmland. Some of the project access roads are existing farm roads that would be graveled and/or relocated for project use, while the balance of project access roads would be new, as described below. Project access roads would interconnect and would be available for use by both project staff and the landowner. No improvements to state or county roads or bridges are anticipated.

Project access roads would typically have a finished width of 12 to 14 feet, a compacted base of native soil and sub-base adapted to the needs of the site, and a gravel surface 4 to 6 inches deep. During construction, the temporary disturbance width of project access roads would be about 50 feet. After construction is complete, the project access roads would be finished for long-term use and the balance of the construction disturbance area revegetated. Vehicle turnouts for construction and operation/maintenance vehicles at turbine pads would typically be surfaced with gravel to a depth of 4 inches, depending on soil conditions. Turnouts would be located surrounding each turbine along a string.

2.1.4.3 Wind Turbine Features

The 600-kW wind turbines under consideration for the project have the design features shown in Table 2.1-1 and Figure 2.1-3. Nacelles (the rectangular structures at the top of the towers) with smooth outer surfaces would enclose the generators, gears, and internal control systems and provide a protected work area for windsmiths (turbine technicians) during inclement weather. Smooth, steel tubular support towers would provide access to the nacelle via a locked door and ladder system that is entirely contained within the tower. These design features will minimize perching opportunities for birds as well as safety risks to workers accessing the turbines for maintenance. The following paragraphs discuss the wind turbines in greater detail.

Table 2.1-1. Project Wind Turbine Features

Design Feature	Description
Rated output of turbine	600 kW
Number of turbines	83
Axis	Horizontal
Rotor orientation	Upwind
Minimum wind speed for turbines to begin operating	10 mph
Number of blades	Three
Rotor (blade) diameter	154 feet
Tower type	Tubular steel
Tower hub (nacelle) height	197 feet
Total height (to top of vertical rotor)	274 feet
Rotational speed	24 rotations per minute
Nacelle	Fully enclosed
Color	White or black blades and gray towers and nacelles

2.1.4.4 Foundations

The applicant would use one of several industry-standard wind turbine foundation designs used in various wind energy projects around the world. The specific design selected for the project would be based on site geotechnical study information and soil borings for the project site. The foundation design would conform to state and county regulations and requirements and good industry practices. All designs would be reviewed and stamped by Oregon-registered geotechnical and civil engineers.

Foundation designs may include post-tensioned hollow cylinder, anchored ring type, drilled shaft, or a gravity mat. The poured concrete foundations would be approximately 12 feet in diameter. Foundation depth would depend on soil and local geologic (bedrock) conditions.

2.1.4.5 Support Towers

The tubular support towers would be constructed of heavy rolled steel that would be fabricated offsite, trucked to the project site in two or more sections, and assembled onsite. The towers would feature a locked entry door at ground level, internal control and communication electronics, and an internal access ladder, with safety platforms, for access to the nacelle. The towers would be smooth, with no avian perch locations, and finished in a light gray to blend into the landscape and sky.

2.1.4.6 Rotors

There would be three rotor blades on each turbine. Each blade would be constructed in one piece, typically of fiberglass, or a fiberglass composite, with a smooth, white or black outer surface. The blades would be fabricated offsite and trucked to the project site. The rotors would be attached to the turbine by bolts and raised into position using a crane. Two of the blades would first be assembled on the ground and hoisted into place, where the third blade would be attached. Should any adjustments be required, blades can temporarily be removed from the turbine and rotated or replaced using a crane.

In most projects, the blades are finished with a smooth white surface. However, the Condon area is subject to winter icing conditions that could cause the blades to come to a halt and remain stationary until the ice melts off the blades. To reduce the adhesion of ice initially, facilitate absorption of radiant heat energy from the sky (that promotes melting of the ice), and help the ice slide off the blades, a black Teflon-like coating could be applied to the blades during the final manufacturing phase. One of the photosimulations in Chapter 3, Section 3.9 shows what black blades might look like.

2.1.4.7 Nacelles and Generators

A turbine nacelle is the housing that covers the operating mechanism of the generators. The nacelles would be mounted atop the tubular support towers using a crane. Each turbine would be equipped with a yaw system that orients the nacelle and rotor blades toward the wind to maximize the capture of wind energy, and each would be controlled by on-board, automated computer monitoring equipment. The nacelles would be accessed internally through the towers. Most servicing of the generation equipment would be completed within the nacelle, which protects both equipment and workers from the elements.

2.1.4.8 Meteorological Towers

A regular feature of large-scale wind power projects is one or more anemometer (wind measurement) towers installed in strategic locations around the project site, generally upwind of the turbines. The anemometers are small devices that measure wind speeds at different heights on the meteorological tower. Each tower has a small concrete foundation, with supporting cables extending to small concrete and steel anchor points. Two to four permanent meteorological towers are planned for the proposed project.

2.1.4.9 Electrical System

The electrical system for the proposed project would collect and convert the electricity from each wind turbine into higher voltage electricity which would be conveyed through a project substation to BPA's Condon-DeMoss transmission line (Figure 2.1-1). The power collection system would conform to the National Electrical Code, National Electrical Safety Code, and prudent utility practice. The collection system is described in more detail below.

Low-voltage electricity would be generated by each wind turbine. Low-voltage cables installed in underground conduits would carry the electricity from the base of the wind turbine tower to a transformer. These transformers would be installed on concrete foundations or pads. The pad-mounted transformers would raise the voltage from 600 volts to 34.5 kilovolts (kV).

Power cables would first connect individual or grouped pad-mounted transformers together, and then connect the pad-mounted transformers to the substation, which would be located near the interconnect point with the BPA Condon-DeMoss line. These cables may be placed underground (where feasible), carried by wooden poles above ground (where soil or rock conditions complicate construction, to link project units, or where a highway must be crossed), or a combination of both installation techniques.

The project substation would use one transformer, rated at 50 megavolt-amperes (MVA), to boost the 34.5-kV level of the power collection system to the 69-kV level of the BPA Condon-DeMoss line. The substation would occupy a construction area of approximately 1 acre, with the finished substation occupying a smaller area of approximately one-half acre. The completed substation would be designed per national standards and requirements of BPA, and it would be fenced for public safety. The substation would be unstaffed.

2.1.4.10 Communication System

Turbine control and monitoring systems use communication lines, which are usually either copper lines similar to telephone lines, or fiber optic lines, both of which are thin and not highly visible. Usually, such lines run to each turbine, parallel with low- and medium-voltage power collection lines either underground or overhead on poles.

2.1.4.11 Operation and Maintenance Building

The O&M building would consist of an enclosed bay for storage of back-up equipment parts and supplies; an office for administration and monitoring of the facility, including the wind turbines; an emergency shelter for workers during winter storms; and parking for vehicles. The projected permanent footprint of the facility (including parking area) would be approximately 1 acre.

The O&M building may be located either on the project site or offsite in an existing structure within the City of Condon. If located onsite, the O&M building would probably be located east of ORE206, south of the grange hall, as shown in Figure 2.1-1. Both sites are being evaluated. However, because the alternate building in Condon is already constructed, this EIS analysis focuses on the potential impacts of the O&M building location on the project site itself.

2.1.4.12 Safety Features and Control Systems

The proposed wind turbines would be fitted with self-diagnostic computer monitoring and control systems located inside the turbine towers. Turbines would be monitored and directed from the O&M facility. In the event of a mechanical or electrical fault, the computer would automatically shut a turbine down. The turbines are designed to survive wind speeds in excess of 130 miles per hour, a speed which exceeds recorded and projected maximum wind speeds at the project site. The electrical connection between the turbines and the electrical grid can be disconnected manually or electronically, either at the individual turbines or at several points along the power collection system, including the interconnection substation.

On the model of turbine being considered for this project, there is a redundant and fail-safe approach to slowing and stopping the rotor blades. The brake system is designed to engage automatically in the event of a control system, grid, or hydraulic failure. Initial braking is accomplished by either a full-span blade feathering (turning the blades so they are parallel to the wind and hence generate no lift or turning power) and, secondarily, a separate hydraulic mechanical disc brake on the high-speed shaft. The two brake systems operate independently, so failure of one does not affect the performance of the other.

Each turbine would be protected from power surges and lightning strikes by surge arrestors and circuit breakers, located at the turbine and along the power collection system. Furthermore, lightning protection would be provided in the design of the blade, rotor, nacelle, tower, and grounding system associated with the foundation.

2.1.4.13 Lighting

Normally, the completed project would have no lights at night. However, the Federal Aviation Administration (FAA) would review the proposed project prior to construction and might recommend that tower markings or aviation safety lighting be installed on a portion of the towers or nacelles. Until the FAA makes its determination, the need for any lighting or marking is uncertain. The FAA could recommend that no lighting is required, due to low aviation use of the area. If recommended, aircraft safety measures might include tower striping, daytime white beacon lighting, nighttime white or red beacons, or a combination.

2.1.5 Construction

The proposed project would use standard construction and operation procedures typical for wind development projects in the western United States. These procedures, with minor modifications to allow for site-specific circumstances, are summarized below. The site is flat or gently sloping, with good drainage, so it is suitable for roads and turbine foundations. There appear to be no local geological features that might impede construction of the project. The relative absence of topographic features on the project site allows a straightforward design layout.

2.1.5.1 Acreage of Construction and Permanent Disturbance

The amount of land that would be temporarily disturbed during construction and permanently occupied by project facilities for phase 1 and phase 2, as well as the cumulative total for both phases combined, is shown in Table 2.1-2.

Table 2.1-2. Acreage of Agricultural and Non-Agricultural Land that Would Be Affected by Phase 1 (41 Turbines), Phase 2 (42 Turbines), and Both Phases Combined (83 Turbines)

Feature	Temporary Construction Disturbance (approx. acres)			Permanent Footprint (approx. acres)		
	Phase 1	Phase 2	Total Both Phases	Phase 1	Phase 2	Total Both Phases
Turbine Pads	9.4	9.6	19.0	5.5	5.7	11.2
New Project Access Roads	20.0	32.4	52.4	7.0	10.1	17.1
O&M Building and Parking Area	1.2	0.0	1.2	0.8	0.0	0.8
Temporary Equipment Storage and Construction Staging	2.1	2.1	4.2	0.0	0.0	0.0
Powerline Poles	0.2	0.4	0.6	0.2	0.4	0.6
Substation	1.2	0.0	1.2	0.6	0.0	0.6
Graveled or Relocated Existing Farm Roads	24.0	1.0	25.0	7.0	1.0	8.0
Meteorological Tower Foundations	0.014	0.028	0.042	0.014	0.028	0.042
Total Land Disturbed	**58.1**	**45.5**	**103.6**	**21.1**	**17.2**	**38.3**
Total Land Disturbed Is Composed of:						
Non-Agricultural Land (existing farm roads)	24.0	1.0	25.0	7.0	1.0	8.0
Agricultural Land (cropland and CRP)	34.1	44.5	78.6	14.1	16.2	30.3

2.1.5.2 General Construction Sequence and Equipment

Construction of phase 1 is anticipated to begin in summer or autumn 2001 and would take from 4 to 5 months to complete, including testing and final commissioning. Construction of phase 2 is anticipated to begin in spring or summer 2002 and would also take from 4 to 5 months to complete.

Table 2.1-3 lists types of equipment that may be used to construct the proposed project.

Table 2.1-3. Construction Equipment Anticipated for the Proposed Project

Equipment	Use
Bulldozer	Road and pad construction
Grader	Road and pad construction
Water trucks	Compaction, erosion and dust control
Roller/compactor	Road and pad compaction
Loader	Loading/unloading/moving soil, sand
Backhoe/trenching machine	Digging trenches for underground utilities
Truck-mounted drilling rig	Drilling tower foundations
Concrete trucks/concrete pumps	Pouring tower and other structure foundations
Cranes	Tower/turbine erection; unloading equipment
Dump trucks	Hauling road and pad materials
Flatbed trucks	Hauling towers, blades and other equipment
Pickup trucks	General use and hauling minor equipment
Small hydraulic cranes/fork lifts	Loading and unloading equipment
Four-wheeled all terrain vehicles	Rough grade access and underground cable installation
Rough terrain forklift	Lifting equipment

For both phases, the first construction activities would include surveying and staking roads, turbine pads, and foundation locations. Existing farm roads may be upgraded for construction purposes, and new project access roads or relocated existing farm roads would be rough graded to access the turbine sites. Finished project access roads, whether upgraded/relocated existing farm roads or new roads, would be constructed at grade, with fill material used only where needed to supplement the existing base or to blend the road into the surroundings. Crossings at low spots would be at grade.

For the transformers, a hole would be dug using a backhoe and a reinforced concrete pad would be poured in place.

The tower and turbine components would be delivered to the site by truck and trailer. The towers would be assembled on the ground in sections and hoisted into place by cranes. Two blades would be attached to the rotor hub, and the nacelle with two blades attached would be hoisted into place. The third blade would be attached once the nacelle is installed on the tower.

Electrical and communication lines would be installed in trenches parallel to the roads. The lines would be connected to the transformers and turbines, and the communication system would be installed. The final steps include connecting the turbines to the interconnect, testing and commissioning the wind project systems, and constructing the O&M building and the substation (during phase 1). Prior to completion of construction, all remaining trash and debris would be removed from the site.

Upon completion of construction, all project access roads would be smoothed to even out low spots, and 4 to 6 inches of gravel, as appropriate to the site, would be applied. During dry weather, road beds would be watered prior to placement of gravel to lessen airborne dust.

2.1.5.3 Road and Pad Construction

Primary access to the project site would be from ORE206. Project access roads would be constructed, or existing roads upgraded, in compliance with applicable building codes. Roads would be located to minimize land disturbance, minimize interference with ongoing agricultural activities, and avoid sensitive resources and unsuitable topography, where feasible. Road locations may be amended during the permitting process for environmental or engineering reasons, to comply with permit conditions, or to accommodate existing grazing and agriculture.

Roads would be built, surfaced (with gravel), and maintained to provide safe operating conditions. The minimum graveled project road width would be 12 to14 feet, with pullouts at selected locations, including turbine pads. Temporary construction disturbance areas along the roads would be approximately 50 feet wide and may increase in uneven terrain if cuts and fills are necessary to construct and stabilize roads on slopes. Temporary construction around turbine pads may occupy an area of approximately 100 feet by 100 feet. Project roads and turbine pads would have a gravel base and surface as necessary for soil and weather conditions. No exposed cut-or-fill slopes greater than 10 feet in height are proposed.

Topsoil removed during road and turbine pad construction would be stockpiled onsite next to the access roads. Topsoil would be respread in cut-and-fill slopes and these areas would be revegetated as soon as possible after road construction. No offsite deposition of material would be necessary.

During construction, operation, and maintenance of the project, traffic would be restricted to existing farm roads and new roads used for project access. Speed limits onsite would not exceed 25 mph to minimize dust and erosion, and to ensure safe and efficient traffic flow. Highway-authorized vehicles and construction equipment would be fueled, serviced, and cleaned offsite. Good construction practices regarding weed-control inspection of hauling vehicles at the construction gravel source would be observed.

Construction equipment that is transported to the project site on flatbed trucks (because such equipment is not authorized for operation on the highway) would be fueled and serviced onsite during the construction phase. Examples of such equipment include bulldozers, graders, roller-compactors, backhoes, trenching equipment, and cranes. All fueling and servicing of such equipment would be in accordance with typical construction practices and in compliance with applicable laws and regulations. Water for dust control and compaction would be secured by contract from the City of Condon or the wells of local landowners.

2.1.5.4 Trenching and Placement of Electrical and Communication Cables

Where feasible, underground electrical and communication cables would be placed in 3- to 5-foot-wide trenches along the length of each turbine string corridor. In some cases, trenches would run from the end of one turbine string to the end of an adjacent string to link more turbines together via the underground network. Due to the presence of shallow soil over bedrock on portions of the project site, some cables that would otherwise be placed underground may be raised above ground as overhead lines supported by wooden poles.

Where soil depth permits, trenches would be mechanically excavated 2 to 4 feet deep and cables laid in place, with appropriate backfilling to separate power cables from communication cables. Trenches would then be backfilled and the area revegetated concurrently with final revegetation or agricultural use of the construction site.

Where necessary because of engineering or soil conditions, the power cables would run from the wind turbines to the substation through overhead conductors and insulators on a 35-kV-rated line on wooden poles. The substation would be a new 35/69-kV step-up substation located adjacent to the BPA 69-kV line that runs west of the project site.

2.1.5.5 Foundations and Installation of Support Towers

Wind Turbine Foundations

Foundations would be designed to accommodate local soil and geologic conditions. Construction would consist of excavating the foundation hole, constructing the reinforced concrete foundation base, curing the concrete, and backfilling, as necessary, with soil to strengthen the foundation in place. Prior to pouring the concrete, anchor bolts for the tubular steel tower would be placed so they would be embedded in the concrete foundation. The poured concrete foundations would be approximately 12 feet in diameter. Foundation depth would depend on soil and local geologic (bedrock) conditions.

After the concrete foundation has cured, tubular steel support tower assemblies would be anchor-bolted to the concrete foundation. The tower may consist of two or three sections that would be individually raised into place by crane and secured, or raised in partially assembled form.

Foundation construction and turbine tower assembly and erection would occur within a 120-foot-wide corridor along turbine string locations. Additional temporary staging areas on the project site may be used to stage tower and turbine components prior to assembly and erection. Following construction, all temporary construction areas surrounding the final surfaced project roads and turbine pads, the temporary staging and assembly areas, and all trenched areas would be reclaimed or prepared for agricultural use as appropriate.

Meteorological Tower Foundations

Two to four permanent meteorological towers would be erected, primarily upwind of the turbine strings. Meteorological towers would be 197 feet tall, with a concrete foundation and wire cable stabilization. Foundation type and depth would depend on specific soil conditions at the tower locations. Meteorological tower foundations would be excavated and then filled with concrete, depending on soil conditions. Some or all of the existing temporary meteorological towers would be removed from the study area.

Other Foundations

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

2.1.5.6 Final Road Grading and Site Clean-Up

Upon completion of construction, all remaining construction debris would be collected and removed from the site. Also, upon completion of construction and removal of all heavy construction equipment, all project site roads would receive final grading and any additional gravel required.

2.1.5.7 Erosion Control

Erosion control would be standard practice both during and after construction and during the revegetation period. Erosion control would comply with state and county standards and would include, where necessary, sediment control basins and traps in drainages or other erosion control devices (such as jute netting, soil stabilizers, or check dams). Surface water flows would be directed away from cut-and-fill slopes and into ditches that drain into natural drainages, with silt traps as necessary. Both during and after site revegetation, all remaining revegetation and erosion control debris would be collected and removed from the site.

2.1.6 Operation and Maintenance

Routine maintenance of the turbines would be necessary to maximize performance and detect potential difficulties. Routine activities would consist primarily of daily travel, generally by pickup trucks, of two to four operation/maintenance staff who would test and maintain the wind facilities (or six personnel after phase 2 is completed). Most servicing would be performed "up-tower" (within the nacelle, without using a crane to remove the turbine from the tower). Occasionally the use of a crane and possibly equipment transport vehicles may be necessary for cleaning, repair, adjustments, or replacement of the rotors or equipment contained in the nacelle. Additionally, all roads, pads, and trenched areas would be regularly inspected and maintained to minimize erosion.

Monitoring the operations of the wind turbines would be conducted both from computers located in the base of each turbine tower and from the O&M facility using telecommunication linkages and computer-based monitoring.

Over longer periods of time, repainting of towers and periodic exchanging of lubricants and hydraulic fluids in the operating mechanisms of the turbines and towers would occur. All lubricants and hydraulic fluids would be carefully stored, used, and disposed of in accordance with applicable laws and regulations.

2.1.7 Workforce

2.1.7.1 Construction

An estimated 60 to 70 delivery and construction workers and technicians would work onsite over the duration of the construction period for each phase. However, not all personnel would be onsite at the same time. Their presence onsite would be phased, depending on the pace of construction, over an estimated construction and equipment testing period of 4 to 5 months for each phase, or possibly longer if seasonal weather delays occurred. Estimated project employment would not exceed 30 workers at any one time.

2.1.7.2 Operation and Maintenance

Once the project becomes operational, there would be two to four operations and maintenance personnel onsite daily during weekly business hours (or six personnel after phase 2 is completed). For safety reasons, technicians working on turbines would typically work in pairs.

2.1.8 Traffic

2.1.8.1 Construction

Construction of wind project roads, facilities, and electrical/communication lines would occur at about the same time, using individual vehicles for multiple tasks. During the construction period for each phase, there would be approximately 25 to 50 daily round trips (50 to 100 one-way trips) of construction, delivery, and personnel vehicles. Over the entire construction period for each phase, this estimate includes the 112 to 231 round trips (224 to 462 one-way trips) of flatbed trucks delivering the tower sections, nacelles, and blades, as well as all dump trucks, concrete trucks, cranes, other construction vehicles, trade vehicles, and personnel vehicles.

2.1.8.2 Operation and Maintenance

Assuming the presence of two to four operation/maintenance personnel (or six after phase 2 is completed), once commercial operations begin, there may be 2 to 6 daily round trips (4 to 12 one-way trips daily) to and from the project site. Ordinary operation/maintenance traffic would consist of personal vehicles and, typically, project pickup trucks. On infrequent occasions, larger equipment (such as flatbed trucks or a crane) may be required. During snow conditions, personnel may use snow removal equipment on project site roads or specialized snow travel vehicles.

Should the O&M building be used to service other wind projects in the region, the number of personnel could increase and this would increase the number of daily round trips to and from the site. Thus if there were a total of 10 personnel using the facility, there may be up to 10 daily round trips (20 one-way trips daily).

2.1.9 Hazardous Materials

All production, use, storage, transport, and disposal of hazardous materials associated with the proposed project would be in strict accordance with federal, state, and local government regulations and guidelines. No extremely hazardous materials (as defined by 40 CFR; Section 335) are anticipated to be produced, used, stored, transported, or disposed of as a result of this project. All lubricants, oils, greases, antifreeze, cleaners and degreasers, and hydraulic fluids used in the operation and maintenance of the wind project would be stored in the O&M building in approved containers above ground. Similarly, all lubricants, oils, greases, antifreeze, cleaners and degreasers, or hydraulic fluids being held for delivery to a certified recycling transporter would be temporarily stored in the O&M building in approved containers above ground.

The project site would be utilized by a variety of construction and operation/maintenance vehicles and equipment. Construction equipment and trucks used for operation/maintenance would be properly maintained to minimize leaks of motor oils, hydraulic fluids, and fuels. Refueling and maintenance of vehicles that are authorized for highway travel would be performed offsite at an appropriate facility during construction, operation, and maintenance. Construction vehicles that are not highway-authorized would be serviced on the project site.

The wind turbines and transformers are anticipated to use the following lubricants, oils, greases, antifreeze, cleaners and degreasers, and hydraulic fluids (or comparable products from other manufacturers):

- Simple Green (cleaner and degreaser);
- Oil-Flo (cleaner and degreaser);

- Mobil SHC 632 (gear oil);
- Mobilux EP 1 (grease);
- Mobil SHC 524 (hydraulic fluid);
- Shell DIALA (R) A oil (mineral oil used as transformer coolant); and
- ethylene glycol (standard commercial antifreeze used in radiators).

None of these products contain any compounds listed as extremely hazardous by the Environmental Protection Agency. These products would be used in moderate quantities (less than 25 gallons per 600-kW turbine) and would be contained entirely within the spill trap and nacelle, minimizing the possibility for accidental leakage. Lubricants, hydraulic fluids, antifreeze, and oils would be checked quarterly, filled as needed, and changed every 1 to 2 years, as recommended by the manufacturer. Fluid changes would be performed up-tower, where any accidental spill could be contained by the nacelle. Spent lubricants, hydraulic fluids, antifreeze, cleaners and degreasers, and oils would be transported and recycled offsite by a certified waste contractor.

Transformers would contain cooling oil that does not contain polychlorinated biphenyls (PCBs). The foundation for the transformers would be designed to contain 125 percent of the capacity of oil in the transformer, in order to protect the site in case of a leak. Transformers would be regularly inspected.

Support towers and other project equipment would arrive onsite already painted and would rarely need repainting during the life of the equipment. Should any repainting be necessary, it would be performed by licensed contractors in compliance with applicable laws and regulations.

Herbicides, if used at all, would be used at landowner request to minimize the potential for introduction of weeds into adjacent cultivated areas. Herbicides would be applied in observance of all regulations governing use and selection of herbicides, either by the landowner or, after consultation with the landowner, by a contract professional. Herbicides would not be stored onsite, and any excess herbicides would be disposed of offsite in accordance with regulations.

2.1.10 Reclamation

Reclamation refers to the restoration of lands used temporarily during construction (such as construction staging areas, excess road margins, etc.) to their approximate condition prior to construction. For the proposed project, nearly all of the project site is plowed fields that are currently under cultivation or other agricultural use, and such uses would continue as the landowners determine. Since most construction would occur on land that is ordinarily plowed fields, reclamation of those lands may consist of replowing and planting for the next crop season. On all other disturbed lands, reclamation activities would be planned to complement landowner decisions as to compatibility between crops, as well as reclamation practices and plant species to be used.

If any areas of native vegetation on the project site are disturbed, they would be revegetated with species native to the area and appropriate for that location. Since most of the project site is located on cultivated land, native vegetation is likely to be encountered, if at all, only in CRP lands or in the layout of project roads bordering fields or project road crossings onto ORE206.

2.1.11 Decommissioning

Decommissioning refers to the dismantling of the project elements and revegetation of the site upon completion of the operating life of the facility. Periodic replacement of equipment can extend the operating life indefinitely, depending on future demand for electricity generated by the project.

Therefore, the estimated life of the project depends primarily on the demand for power, which is expected to continue growing.

At the end of the project's useful life, the owner would obtain any necessary authorization from the appropriate regulatory agencies and from the landowners to decommission the facilities. Decommissioning involves removing the turbines and support towers, transformers, and substation, and removing the upper portion of foundations so that they do not interfere with agricultural practices. Generally turbines, electrical components, and towers are either resold or recycled for scrap. All unsalvageable materials would be disposed of at authorized sites in accordance with laws and regulations.

Site reclamation would be based on site-specific requirements and techniques commonly employed at the time the area is reclaimed. As necessary, this could include regrading, spot replacement of topsoil, and revegetation of all project-disturbed areas that would not be used immediately for plow-based agriculture. Foundations would be removed to a depth of 2 feet, or less if bedrock is encountered. Project access roads would be reclaimed or left in place based on landowner preference. The land would then revert exclusively to landowner control.

2.2 No Action Alternative

An EIS must consider the alternative of not taking the proposed action. Under the No Action Alternative, BPA would not execute one or more power purchase and transmission services agreements to acquire and transmit up to the full electrical output of SeaWest's proposed Condon Wind Project. Because BPA's transmission line is the only transmission line nearby, it is highly unlikely that the project would be implemented without a commitment from BPA to acquire the energy output or transmit it over BPA transmission lines to another purchaser. Without BPA's commitment, the project would not be constructed or operated, and the resulting environmental impacts described in this EIS would not occur.

However, the region's need for power is expected to continue to grow (as documented in the Northwest Power Planning Council, Fourth Northwest Power Plan; Energy Information Administration, Annual Energy Outlook 2001). Under the No Action Alternative, a greater proportion of other energy resources would be developed. The predominant resource is most likely to be combined-cycle combustion turbines (CTs) fueled by natural gas (Northwest Power Planning Council, Northwest Power Supply Adequacy/Reliability Study Phase 1 Report, Paper Number 2000-4, March 6, 2000). BPA's Resource Programs EIS (RP EIS) and Business Plan EIS included an evaluation of the environmental impacts of energy resources including CTs. These impacts are discussed in brief throughout Chapter 3 in the No Action Alternative sections.

2.3 Alternatives Considered but Eliminated from Detailed Study

2.3.1 Alternative Energy Resources

BPA's RP EIS analyzed environmental trade-offs among all available energy resources including conservation, renewable resources (solar, wind, geothermal, biomass, and hydro), system efficiency improvements, cogeneration, CTs, nuclear power, and coal. Acquisition of wind power is consistent with BPA's Resource Programs and Business Plan Records of Decision (see Section 1.5). Therefore, this EIS focuses on a site-specific analysis of the proposed project.

2.3.2 Alternative Transmission Path

No other transmission alternatives were studied. BPA's Condon-DeMoss 69-kV transmission line is the only transmission line near enough to the project to provide an economical point of interconnection between the project and the transmission grid. Connecting to a different point on the grid would require constructing a lengthy new transmission line from the project. Such a line would have far greater environmental impacts than the proposed plan of interconnection to the existing Condon-DeMoss line, and it would render the project economically unfeasible.

2.3.3 Alternative Turbine Locations

SeaWest considered placing turbine strings in different locations within the study area. The project site described in this EIS was chosen for reasons including wind quality, access, proximity to BPA's transmission line, and environmental factors. Individual turbines within strings were also located according to these same factors.

2.4 Summary of Environmental Impacts of the Alternatives

Table 2.4-1 compares the Proposed Action and the No Action Alternative based on the purposes of the project described in Section 1.3.

Table 2.4-1. Comparison of Alternatives

Purposes	Proposed Action	No Action
Protect BPA and its customers against risk.	Acquiring and transmitting the available power from the proposed wind project would allow BPA to increase the availability of a reliable supply of electrical power to meet the need of it's customers in the Pacific Northwest. By acquiring the electrical output from this project, this affords BPA the opportunity to add power to its system through the development of renewable resources - such as wind - that are environmentally clean.	By not purchasing and transmitting the power output from the proposed project, BPA would have to look to other sources of electrical power to supply its customers. The most predominant new energy sources are likely to be combustion turbines burning non-renewable fossil fuels, which are less environmentally clean than renewable resources such as wind energy.
Ensure consistency with BPA's responsibility under the Northwest Power Act to encourage the development of renewable energy resources.	Purchasing the electrical power from the proposed wind project would ensure consistency with the Northwest Power Act, by promoting a project that utilizes a renewable energy resource (wind).	By not purchasing the electrical power from the proposed project, BPA would have one less opportunity to ensure consistency with the Northwest Power Act.
Meet customer demand for energy from renewable energy resources, thereby assuring consistency with BPA's Business Plan EIS (DOE/EIS-0183, June 1995) and Business Plan Record of Decision (ROD).	Acquiring and transmitting the electrical power from the proposed wind project would assure consistency with BPA's Business Plan EIS and Business Plan ROD by helping to meet customer demand for electricity through the development of wind energy.	By not purchasing and transmitting the electrical power from the proposed project, BPA would decrease its ability to meet customer demands for power through the development of renewable energy resources.

Purposes	Proposed Action	No Action
Ensure consistency with the resource acquisition strategy of BPA's Resource Programs EIS (DOE/EIS-0162, February 1993) and ROD.	BPA's Resource Programs EIS and ROD firstly emphasizes conservation and efficiency improvements, and secondly emphasizes renewable and thermal resources, as the most cost-effective and environmentally responsible option for BPA's long-term conservation and generation resource acquisition program. Purchasing the electrical power from the proposed wind project would implement one important element of that EIS and ROD.	By not purchasing the electrical power from the proposed project, BPA would pass up an opportunity to implement one of the cost-effective and environmentally responsible options available for meeting the objectives of BPA's long-term conservation and generation resource acquisition program.
Meet the objective in the January 2000 Strategic Plan of BPA's Power Business Line to acquire at least 150 average megawatts (MW) of new renewable resources by the end of fiscal year 2006 in order to meet customer demand for new renewable resources.	Acquiring the available power from the proposed wind project would contribute, in a timely way, to BPA meeting the 150 average MW objective of the 2000 Strategic Plan. This is especially true since Phase 1 of the proposed project could be on line by as early as December 2001, and Phase 2 could be on line by late spring 2002.	By not acquiring the electrical power from the proposed project, BPA would forego a near-term opportunity to contribute to meeting the Power Business Line's acquisition objective of 150 average MW within the next five years.

2.5 Preferred Alternative

BPA's preferred alternative is the proposed action to execute one or more power purchase and transmission services agreements to acquire and transmit up to the full electrical output of SeaWest's proposed Condon Wind Project. The proposed action is the only alternative that meets the underlying need for action and best meets the purposes of action.

The preferred alternative is also the environmentally preferred alternative.