GOLDEN HILLS WIND PROJECT
COMPLETE APPLICATION FOR A SITE CERTIFICATE

ORGANIZATIONAL EXPERTISE
See: ASC Exhibit D, July 2007
Addendum 1, Exhibit E, May 2008

STRUCTURAL STANDARD
See: ASC Exhibit H, July 2007
Responses to RAI#1, Addendum 1, Exhibit H, May 2008
Addendum 1, Exhibit H, Figures H-1A and H-2A, May 2008

SOIL PROTECTION
See: ASC Exhibit I, July 2007
Responses to RAI#1, Addendum 1, Exhibit I, May 2008

LAND USE
See: ASC Exhibit K, July 2007
DEA memorandum from Alex Dupey to Dana Siegfried, "RAI Land Use Exh K"
File "NHCO" response, attached to July 17 2008 email from Dana Siegfried to Adam Bless

PROTECTED AREAS
See: ASC Exhibit L, July 2007
Responses to RAI#1, Addendum 1, Exhibit L, May 2008

RETIREMENT AND FINANCIAL ASSURANCE
See: ASC Exhibits B, C, M and W, July 2007
ASC Exhibit B Supplement, Addendum 1, Exhibit B, May 2008
ASC Exhibit C Supplement, Addendum 1, Exhibit C, May 2008
Responses to RAI#1, Addendum 1, Exhibit W, May 2008
Letter from JPMorgan Chase Bank, N.A., dated June 27, 2008

FISH AND WILDLIFE HABITAT
See: ASC Exhibit P, July 2007
Golden Hills Habitat Mitigation and Revegetation Plan, June 2008
Golden Hills Wildlife Monitoring and Mitigation Program, May 2008

THREATENED AND ENDANGERED SPECIES
See: ASC Exhibit Q, July 2007

SCENIC RESOURCES
See: ASC Exhibit R, July 2007
Responses to RAI#1, Addendum 1, Exhibit R, May 2008

Project Order, Revision 1, May 23, 2008

HISTORIC, CULTURAL AND ARCHAEOLOGICAL RESOURCES

See: ASC Exhibit S, July 2007
Revised ASC Exhibit S, June 2008
Supplemental Phase 1B Archeological Investigation Report for the Golden Hills Wind Energy Development, Tetra Tech June 2008, plus Appendix A, B, and C

RECREATION

See: ASC Exhibit T, July 2007
Addendum 1, Exhibit T, May 2008

PUBLIC SERVICES

See: ASC Exhibit U, July 2007
Responses to RAI#1, Addendum 1, Exhibit O, May 2008

WASTE MINIMIZATION

See: ASC Exhibit V, July 2007

PUBLIC HEALTH & SAFETY STANDARDS

See: ASC Exhibit DD, July 2007

SITING STANDARDS FOR WIND ENERGY FACILITIES

See: ASC Exhibit DD, July 2007

SITING STANDARDS FOR TRANSMISSION LINES

See: ASC Exhibit AA, July 2007

NOISE CONTROL REGULATIONS

See: ASC Exhibit X, July 2007
ASC Exhibit X Supplement, Addendum 1, Exhibit X, May 2008
PDF File "Golden Hills_C96 NoiseContours" transmitted by email 7/7/08
PDF file "Golden Hill_GE77 NoiseContours" transmitted by email 7/7/08

REMOVAL-FILL LAW

See: ASC Exhibit J, July 2007
Addendum 1, Exhibit J, May 2008
DEA memo Dana Siegfried to Adam Bless, Jan 11, 2008, "Wildlife Mitigation and Wetlands"

GROUND WATER ACT

See: ASC Exhibit O, July 2007

EXHIBIT B

GENERAL INFORMATION ABOUT THE PROPOSED FACILITY

OAR 345-021-0010(1)(b)

TABLE OF CONTENTS

FIGURES

B.1 DESCRIPTION OF THE PROPOSED FACILITY

OAR 345-021-0010(1)(b) *Information about the proposed facility, construction schedule, and temporary disturbances of the site, including:*

OAR 345-021-0010(1)(b)(A) *A description of the proposed energy facility, including as applicable:*

(i) The nominal electric generating capacity and the average electrical generating capacity, as defined in ORS 469.300.

Response: The nominal generating capacity of the proposed Golden Hills Wind Project (Project) will be 400 MW. The average generating capacity is anticipated to be approximately 133 MW.

(ii) Major components, structures, and systems, including a description of the size, type, and configuration of equipment used to generate electricity and useful thermal energy.

Response:

B.1.1 Facility Overview

The Project will be located on private land in an unincorporated area of Sherman County. It will consist of up to 267 wind turbines. The Project will interconnect with the Bonneville Power Administration's (BPA) transmission system at two locations – one near Klondike Schoolhouse Substation (200 MW) and at John Day Substation (200 MW). Transmission from the project substations to the interconnection points will involve one 0.7-mile long overhead transmission line and one 11-mile long overhead transmission line.

It is anticipated that the Project will begin construction in spring 200[9. BPAE has signed long-term land agreements with landowners on whose property turbines may be located. A list of the owners of record of property within or adjacent to the proposed project site is contained in Exhibit F.

B.1.2 Power Generation Equipment and Systems

The Project is expected to consist primarily of the following facilities:

- Wind turbines (Addendum Figure B-1) that have an aggregate nominal nameplate generating capacity of up to 400 MW. The turbines will most likely consist of one of the following:
  - 1.65 MW turbine with hub height of 78 meters and rotor diameter of 82 meters.
  - 2.5 MW turbine with a hub height of 80 meters and rotor diameter of 96 meters.

Wind turbines will be sited within 900-foot corridors; their precise locations within each corridor will be determined by the Applicant based on the wind turbine model selected and the various siting criteria.

- Approximately 51 miles of newly constructed access roads and turnaround areas.
- Up to six permanent meteorological towers and a supervisory control and data acquisition system.
- A 34.5-kilovolt (kV) power collection system linking each turbine to the next and to one of two project substations. The 54-mile long power collection system will be largely underground, but might be overhead in some locations.
- Two project substations - one at the southeastern section of the site and one in the west section of the site. As noted above, one 0.7 and one 11-mile long overhead transmission line will be constructed from each substation to the points of interconnection with BPA.
- An operations and maintenance (O&M) facility, including shop facilities, a control room, a maintenance yard, a kitchen, an office, a washroom, and other facilities typical of this type of facility.

The following sections provide detailed information about project components, including the wind turbines, the O&M facility, communications equipment, access roads and laydown areas, and the electrical system. Addendum Figure B-3 shows the disturbance area for these facilities.

B.1.3 Wind Turbines

A wind turbine features a nacelle mounted on a tower. The nacelle houses the generator and gearbox, and supports the rotor and blades at the hub. The turbine tower supports and provides access to the nacelle. The turbines are connected by power collection systems linked to an electric substation.

The generator installed in each wind turbine will have a nameplate rating from approximately 1.65 MW to 2.5 MW. The Applicant has not selected the wind turbine model or models that will be installed in the Project. Wind turbines will be sited within corridors approximately 900 feet wide. The locations of the turbine corridors are illustrated in Addendum Figure C-2 (in Exhibit C). The number of turbines in each corridor, the spacing between turbines, and their precise locations within the corridor will be determined prior to construction by the Applicant, based on the wind turbine models selected and various siting criteria, such as terrain and noise. Figure B-2 shows the frequency and direction of wind in the project area.

Because the Applicant seeks Energy Facility Siting Council (Council) approval to select from a range of defined options with respect to turbine vendor and size, number of turbines, and their locations within turbine corridors, the studies and analyses provided in this Application for Site Certificate Application (ASC) are based on a worst case approach tailored for each resource subject to a Council standard. For example, for the

scenic and aesthetic evaluation, both the Maximum Turbine Layout and the Minimum Turbine Layout were analyzed and the layout having the maximum impact is described in detail in the appropriate exhibit of this ASC. Similarly, for wetlands, fish and wildlife habitat, and threatened and endangered species, all areas within the proposed turbine corridors have been surveyed and the impact calculations for these resources, presented in Exhibits J, P, and Q, respectively, reflect the maximum potential impacts from the Project.

B.1.4 Project Roads

Existing roads within the Project are typically 16 to 24 feet wide. Improvements for construction vehicles generally will involve providing an all-weather surface for roads with a gravel surface. Existing intersections will be widened as needed to allow trucks to maneuver into and out of the construction area. A turning radius of 130 to 150 feet is needed.

In areas where there are no roads near proposed wind turbine strings, new access roads (16 feet wide with 2-foot shoulders) will be constructed. Permanent turnaround areas will be situated at the end of each turbine string. Approximately 50 miles of new access roads and turnaround areas will be constructed. During construction, temporary disturbance will occur an average of 8 feet on each side of the road.

B.1.5 Meteorological Towers and SCADA

Up to six meteorological towers will be placed throughout the project site. The meteorological towers will collect wind resource data. These towers will be unguyed tubular structures up to approximately 85 meters (279 feet) tall.

In addition, a supervisory control and data acquisition (SCADA) system will be installed at the Project. The SCADA system will assist with the remote operation of the wind turbines; collect operating data from each wind turbine, and archive wind and performance data from various sources. The SCADA system will be linked (via fiber optic cables or other means of communication) to a central computer in the O&M facility. Where linked via fiber optic or other type of cables, those cables will generally be installed alongside the power collection conductors.

B.1.6 Power Collection System

The Project's electrical system will consist of: (1) a power collection system, which will collect energy generated by each wind turbine, increase voltage through a pad-mounted transformer, and deliver it via electric cables to (2) the Project substations, where transformers will further increase the voltage of energy so that it can be transmitted via a high-voltage transmission line that will deliver power from the project substation to BPA.

Each wind turbine will generate power at approximately 690 volts (voltage could vary, depending on the turbine model ultimately selected for the Project). A transformer next to each tower will increase the voltage to 34.5 kV. From the transformer, power will be

transmitted via electric cables. The cables will be buried, 3 or more feet below the ground surface, in a trench up to 3 feet wide. In areas where collector cables from several strings of turbines follow the same alignment (for example, near the Project substation); multiple sets of cables could be installed in parallel trenches up to 50 feet wide. There will be approximately 62 miles of underground electric cable corridor.

In some locations, the collector lines may be constructed aboveground, on pole or tower structures. Aboveground structures allow the collector cables to span terrain such as canyons, native grasslands, wetlands, and intermittent streams, thus reducing environmental impacts, where multiple collection circuits run in parallel, or to span cultivated areas, thus reducing impacts to farming. If used, overhead structures will generally be about 35 feet tall.

B.1.7 Substations, Transmission Lines and Interconnection to BPA

There will be two project substations that will deliver power to the BPA high-voltage transmission system.

The Project will interconnect with the BPA system by constructing a new substation in the eastern section of the project site on a graveled and fenced area of up to 2 acres, with a transformer, switching equipment and parking area. A transmission line approximately 0.7 miles long, (see Addendum Figure C-2 in Exhibit C), would be built to connect to the PPM Energy transmission line that runs toward the north, on the west side of Sandon Road.

The second project substation would be in the western section of the project site; it also would be approximately 2 acres, with a transformer, switching equipment and parking area. A transmission line approximately 11 miles long (see Addendum Figure C-2 in Exhibit C) would be constructed from this substation to BPA's John Day substation.

B.1.8 O&M Facility

The O&M facility will be on up to 5 acres of land with approximately 5,000 square feet of enclosed space, including office and workshop areas, control room, kitchen, bathroom, shower, and other facilities typical of this type of facility. Water for the bathroom and kitchen will be acquired from an onsite well constructed by a licensed contractor according to local and state requirements. Water use is not expected to exceed 5,000 gallons per day. Domestic wastewater generated at the O&M facility will drain into an onsite septic system. A graveled parking area for employees, visitors, and equipment will be located in the vicinity of the building. The O&M facility will be located at one of two locations shown on Addendum Figure C-2.

B.1.9 Laydown Areas and Access Roads

Construction of the Project will require improving and widening some existing county roads and constructing new roads to provide access for construction vehicles. Use of the new roads will continue during operation of the Project. The Project will also require

laydown areas during construction for the delivery of wind turbines and other parts and equipment.

There will be up to seven principal, temporary laydown areas for the staging of construction equipment, wind turbines and their components, towers, and other parts, facilities, and equipment. Each laydown area will be covered with gravel. The gravel will be removed and the area restored after construction has been completed.

In addition to the permanent access roads, temporary access roads or areas, each up to 36 feet wide, might be required for construction of some facilities.

B.2 SITE PLAN

(iii) A site plan and general arrangement of buildings, equipment, and structures.

Response: The site plan map showing the general arrangement of project facilities is Addendum Figure C-2

B.3 FUEL AND CHEMICAL STORAGE FACILITIES

(iv) Fuel and chemical storage facilities, including structures and systems for spill containment;

Response: Limited quantities of lubricants, cleaners and detergents will be stored inside at the O&M building. No fuel will be stored on site.

B.4 FIRE PREVENTION

(v) Equipment and systems for fire prevention and control.

Response: The wind turbines will be equipped with built-in fire prevention measures that allow the turbines to shut down automatically before mechanical problems create excess heat or sparks. The use of underground power collector cables substantially reduces the risk of fire from short circuits caused by wildlife or lightning. Most of the Project's new access roads are oriented perpendicular to the prevailing winds and thus serve as effective fire breaks. After construction has been completed, there will be no welding, cutting, grinding, or other flame- or spark-producing operations near the turbines.

All onsite employees for both construction and operations will receive annual fire prevention and response training by a professional fire safety training firm. The appropriate Sherman County volunteer fire departments will be asked to participate in this training. Employees will be prohibited from smoking outside of company vehicles during dry summer months.

Each onsite company vehicle will contain a fire extinguisher, water spray can, shovel, Emergency Response procedures book, and a two-way radio for immediate communications with the O&M facility. The O&M facility staff will coordinate fire response efforts. Water-carrying trailers (water buffaloes) will be present at appropriate

locations around the Project to be determined in consultation with the local fire departments. A water buffalo will be brought to any job site where there is a substantial risk of fire. Each water buffalo will have a capacity of 500 gallons and be equipped with a pump and hoses. The water buffaloes can be towed by a number of vehicles, including service trucks and pickup trucks; such vehicles will be present in sufficient numbers at all times during construction and operation of the Project. All local fire departments will have maps of and gate keys to the project site.

B.5 SOURCE OF FUELS, FUEL CYCLES, ELECTRICAL LOADS, ENERGY FLOW, AND EXCESS HEAT DISPOSAL

(vi) For thermal power plants:

(I) A discussion of the source, quantity and availability of all fuels used to generate electricity or useful thermal energy.

(II) Process flow, including power cycle and steam cycle diagrams to describe the energy flows within the system;

(III) Equipment and systems for disposal of waste heat;

(IV) The fuel chargeable to power heat rate;

Response: Not applicable

B.6 UNDERGROUND GAS STORAGE

(vii) For surface facilities related to underground gas storage, estimated daily injection and withdrawal rates, horsepower compression required to operate at design injection or withdrawal rates, operating pressure range and fuel type of compressors.

Response: Not Applicable

B.7 LIQUEFIED NATURAL GAS STORAGE

(viii) For facilities to store liquefied natural gas, the volume, maximum pressure, liquefication and gasification capacity in thousand cubic feet per hour.

Response: Not applicable

B.8 DESCRIPTION OF RELATED OR SUPPORTING FACILITIES

OAR 345-021-0010(1)(b)(B) *A description of major components, structures, and systems of each related or supporting facility.*

Response: Some existing county roads and intersections would have to be improved to allow construction equipment to access the site. Improvements could involve widening roads to 24 feet or re-surfacing with gravel or asphalt. Intersections would be widened

to achieve the necessary 130- to 150-foot radius required by large trucks delivering project components.

Electrical service to the O&M building will be provided by the applicable local utility. If the Highway 97 location is used for the O&M facility, electric service will be supplied by PacifiCorp most likely via a ¼ mile service line from their distribution line running along the east side of Highway 97. If the Woods Lane O&M location is used, the facility will be serviced by an existing service line from the Wasco Electric Cooperative distribution line on Woods Lane.

B.9 DIMENSIONS OF MAJOR STRUCTURES AND FEATURES

OAR 345-021-0010(1)(b)(C) *The approximate dimensions of major facility structures and visible features.*

Response: Dimensions of major facility structures are as follows:

- Turbines up to 80 meter hub height and up to 96 meter rotor diameter
- Permanent project roads will be approximately 20 feet wide, including shoulders
- Met towers will be approximately 85 meters high
- Substations will occupy approximately 2 acres each; the O&M facility will be 5 acres
- One 230 kV transmission line 4 to 5 miles long using monopole structures, and one 500 kV transmission line approximately 11 miles long.

B.10 CORRIDOR EVALUATION AND SELECTION

OAR 345-021-0010(1)(b)(D) *If the proposed energy facility is a pipeline or a transmission line or has, as a related or supporting facility, a transmission line or pipeline, that, by itself, is an energy facility under the definition in ORS 469.300, a corridor selection assessment explaining how the Applicant selected the corridor(s) for analysis in the application. In the assessment, the Applicant shall evaluate the corridor adjustments the Department has described in the Project order, if any. The Applicant may select any corridor for analysis in the application and may select more than one corridor. However, if the Applicant selects a new corridor, then the Applicant must explain why the Applicant did not present the new corridor for comment at an informational meeting under OAR 345-015-0130. In the assessment, the Applicant shall discuss the reasons for selecting the corridor(s), based upon evaluation of the following factors:*

(i) Least disturbance to streams, rivers and wetlands during construction;

(ii) Least percentage of the total length of the pipeline or transmission line that would be located within areas of Habitat Category 1, as described by the Oregon Department of Fish and Wildlife;

(iii) Greatest percentage of the total length of the pipeline or transmission line that would be located within or adjacent to public roads, as defined in ORS 368.001, and existing pipeline or transmission line rights-of-way;

(iv) Least percentage of the total length of the pipeline or transmission line that would be located within lands that require zone changes, variances or exceptions;

(v) Least percentage of the total length of the pipeline or transmission line that would be located in a protected area as described in OAR 345-022-0040;

(vi) Least disturbance to areas where historical, cultural or archaeological resources are likely to exist; and

(vii) Greatest percentage of the total length of the pipeline or transmission line that would be located to avoid seismic, geological and soils hazards; and

(viii) Least percentage of the total length of the pipeline or transmission line that would be located within lands zoned for exclusive farm use.

Response: The Project is not a pipeline or transmission line, and does not have, as a related or supporting facility, a pipeline or transmission line that by itself meets the definition of an energy facility.

B.11 PIPELINE AND TRANSMISSION LINE

OAR 345-021-0010(1)(b)(E) *For any pipeline or transmission line, regardless of size:*

(i) The length of the pipeline or transmission line.

Response: There are no pipelines associated with the Project. The transmission line from the southeast substation to the PPM Energy transmission line on the west side of the Sandon Road is approximately 0.7 miles long. The transmission line from the west substation to the John Day substation is approximately 11 miles long.

(ii) The proposed right-of-way width of the pipeline or transmission line, including to what extent new right-of-way will be required or existing right-of-way will be widened.

Response: The transmission line from the southeast substation to the PPM transmission line on the west side of Sandon Road will be built on project leased land. The right-of-way width for this section of transmission line will be 150 feet wide. At Sandon Road, the project's output will be carried via a transmission line owned by PPM Energy that parallels Sandon Road to the Klondike-Schoolhouse Substation.

The right-of-way for the transmission line to the John Day substation will be 200 feet wide. Approximately 6 miles of this transmission line will be parallel to existing BPA right-of-way.

(iii) If the proposed corridor follows or includes public right-of-way, a description of where the facility would be located within the public right-of-way, to the extent known. If the Applicant proposes to locate all or part of a pipeline or transmission line adjacent to but not within the public right-of-way, describe the reasons for locating the facility outside the public right-of-way. The application must include a set of clear and objective criteria

and a description of the type of evidence that would support locating the facility outside the public right-of-way, based on those criteria.

Response: As stated above, the transmission line from the southeast substation terminates at Sandon Road where it meets an existing PPM Energy transmission line. A portion of the 11 mile transmission line from the west substation to BPA's John Day substation will be located adjacent and parallel to the BPA 500 kV transmission line right-of-way.

(iv) For pipelines, the operating pressure and delivery capacity in thousand cubic feet per day and the diameter and location, above or below ground, of each pipeline.

Response: Not applicable

(v) For transmission lines, the rated voltage, load carrying capacity, and type of current and a description of the transmission line structures and their dimensions.

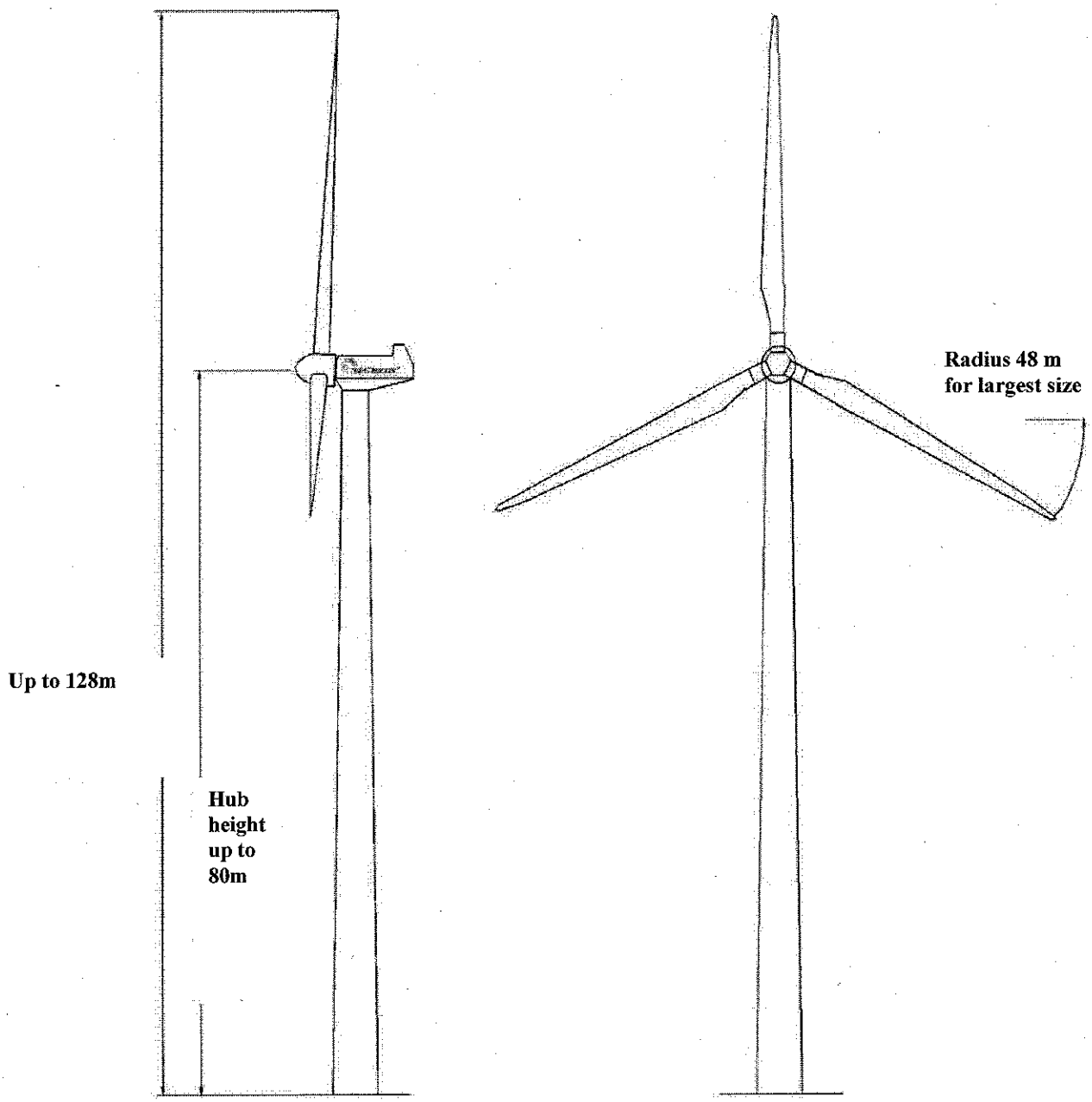
Response: One transmission line will be 230 kV; the other will be 500kV. Each line will have a load carrying capacity adequate for the peak capacity of all of the connected turbines. The transmission line to John Day substation will be approximately 11 miles long strung on 117 foot high tubular steel or concrete towers; the transmission line from the southeast collector station to Sandon Road will be approximately 0.7 miles long strung on 100 to 110-foot high tubular steel or concrete towers.

B.12 CONSTRUCTION SCHEDULE

OAR 345-021-0010(1)(b)(F) *A construction schedule including the date by which the Applicant proposes to begin construction and the date by which the Applicant proposes to complete construction. Construction is identified in OAR 345-001-0010. The Applicant shall describe in this exhibit all work on the site that the Applicant intends to begin before the Council issues a site certificate. The Applicant shall include an estimate of the cost of that work. For the purposes of this exhibit, "work on the site" means any work within a site or corridor, other than surveying, exploration or other activities to define or characterize the site or corridor, that the Applicant anticipates or has performed as of the time of submitting the application.*

Response: The Applicant proposes to begin construction in spring 2009, and complete construction by December 31, 2014. Prior to obtaining the Site Certificate, the Applicant proposes to do no work other than surveys (environmental surveys, geotechnical explorations, and similar survey work).

FIGURES

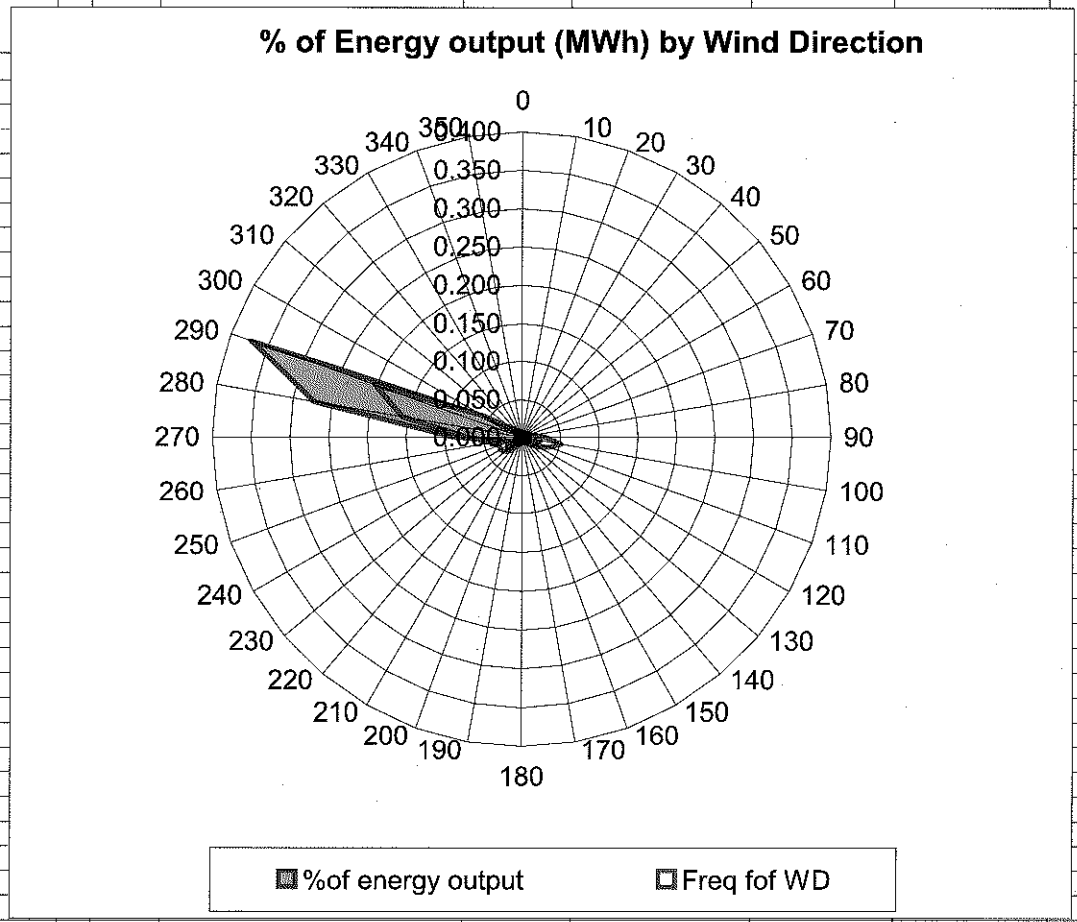


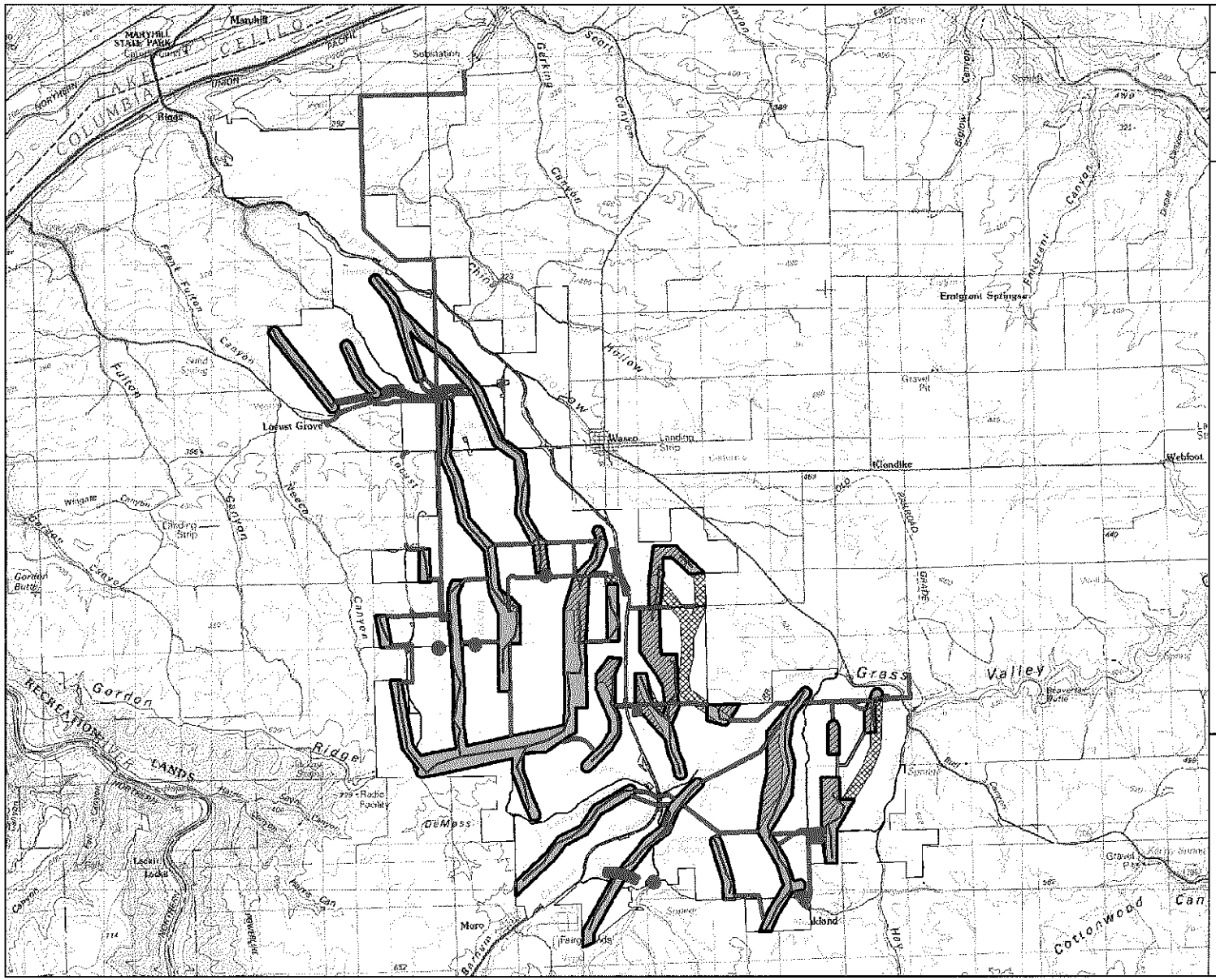
Golden Hills Wind Project
Figure B-1

Figure B-2

3702			10deg Wind Rose by measured data. (un-weighted)							
Location:	Pinkerton, Sherman County, OR									
Last Revised:										
21-May-07			Posible DATA:		8760	Hub Height :	80.00	m		
First Date			Valid DATA:		8453	** hub height WS calculated by 12x24 shear				
01-May-04			% of Valid DATA:		96%	Assumed turbine type =	C96_2500_1.20		(For reference only)	
Last Date										
30-Apr-05										

WD_BIN 30 deg	Count	Freq fof WD	Average of 80mWS sheared	Sum of C96_2500_1.20	%of energy output
0	42	0.005	2.51	2	0.000
10	47	0.006	2.49	1	0.000
20	38	0.004	3.39	6	0.001
30	39	0.005	2.41	1	0.000
40	56	0.007	3.43	9	0.001
50	61	0.007	3.33	9	0.001
60	84	0.010	4.11	23	0.003
70	75	0.009	4.71	23	0.003
80	146	0.017	5.46	73	0.010
90	261	0.031	5.41	110	0.015
100	441	0.052	5.45	185	0.025
110	321	0.038	5.60	152	0.020
120	222	0.026	4.21	37	0.005
130	133	0.016	3.52	13	0.002
140	89	0.011	3.50	7	0.001
150	69	0.008	3.06	6	0.001
160	45	0.005	2.91	2	0.000
170	38	0.004	2.66	2	0.000
180	61	0.007	3.31	10	0.001
190	70	0.008	4.09	19	0.002
200	97	0.011	4.55	33	0.004
210	121	0.014	5.28	57	0.008
220	186	0.022	5.93	115	0.015
230	260	0.031	6.48	178	0.024
240	268	0.032	6.18	162	0.021
250	259	0.031	5.27	105	0.014
260	324	0.038	6.25	203	0.027
270	605	0.072	8.02	664	0.088
280	1324	0.157	9.80	2053	0.272
290	1709	0.202	10.24	2805	0.372
300	475	0.056	7.29	425	0.056
310	178	0.021	4.42	37	0.005
320	117	0.014	3.04	8	0.001
330	84	0.010	3.02	5	0.001
340	55	0.007	2.61	3	0.000
350	53	0.006	2.1	1	0.000
Grand Total	**8453**	1.000	**7.092**	**7539**	**1.000**





Golden Hills Wind Project
Addendum to Exhibit B

FIGURE B-3
Disturbance Areas

Legend

- Lease Area
- Disturbance Areas
- REVISED Survey Corridors
- Additional Survey Corridors
- Removed Survey Corridors

N

0 0.8 1.6 2.4 3.2
Miles

Data Sources:

30x60 USGS Quadrangles:
Condon, OR 1981
Goldendale, OR-WA 1980
Hood River, OR-WA 1982
Toppenish, WA 1979

Oregon Geospatial Enterprise Office (GEO)

Map Document: (P:\ES\POC00000005\0600\NFO\GS\arcmap\Addendum\Fig_B-3_DisturbanceAreas_Addand1_032508.mxd)
5/16/2008 – 11:21:02 AM

EXHIBIT C

PROPOSED LOCATION AND MAPS

OAR 345-021-0010(1)(c)

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FIGURES

C.1 INTRODUCTION

OAR 345-021-0010(1)(c) *Information about the location of the proposed facility, including:*

C.2 MAPS

OAR 345-021-0010(1)(c)(A) *A map or maps showing the proposed locations of the energy facility site, all related or supporting facility sites and all areas that might be temporarily disturbed during construction of the facility in relation to major roads, water bodies, cities and towns, important landmarks and topographic features, using a scale of 1 inch = 2000 feet or smaller when necessary to show detail; and*

Response: Addendum Figure C-1 shows the project area and surrounding vicinity, including major roads, water bodies, cities and towns, and topography. Addendum Figure B-3 shows the areas that might be temporarily disturbed during construction. Addendum Figure C-2 shows the project components such as turbine corridors, project access roads, laydown areas, substations, O&M facility, and transmission corridors.

C.3 LOCATION OF FACILITY COMPONENTS

OAR 345-021-0010(1)(c)(B) *A description of the location of the proposed energy facility site, the proposed site of each related or supporting facility and areas of temporary disturbance, including the approximate land area of each. If a proposed pipeline or transmission line is to follow an existing road, pipeline, or transmission line, the applicant shall state to which side of the existing road, pipeline, or transmission line the proposed facility will run, to the extent it is known.*

Response: The proposed facility site is located near Wasco in Sherman County, Oregon. It is located on parcels consisting of over 30,000 acres owned by several landowners, which have been leased in whole or in part to the Applicant for the development of the proposed facility. The property is located in the Townships 1 and 2 North and Ranges 17, 18 and 19 East. It is accessed by traveling approximately 7 miles south on U.S. Highway 97 from its intersection with Interstate 84. The proposed Golden Hills Wind Farm will be located on approximately 141 acres of the leased area. Up to 1074 acres of additional leased area would be temporarily impacted to varying degrees due to underground collector system construction, material and equipment staging, crane movement, or other activities that will not permanently affect the use of the land. The proposed facility would have up to 267 wind generating turbines.

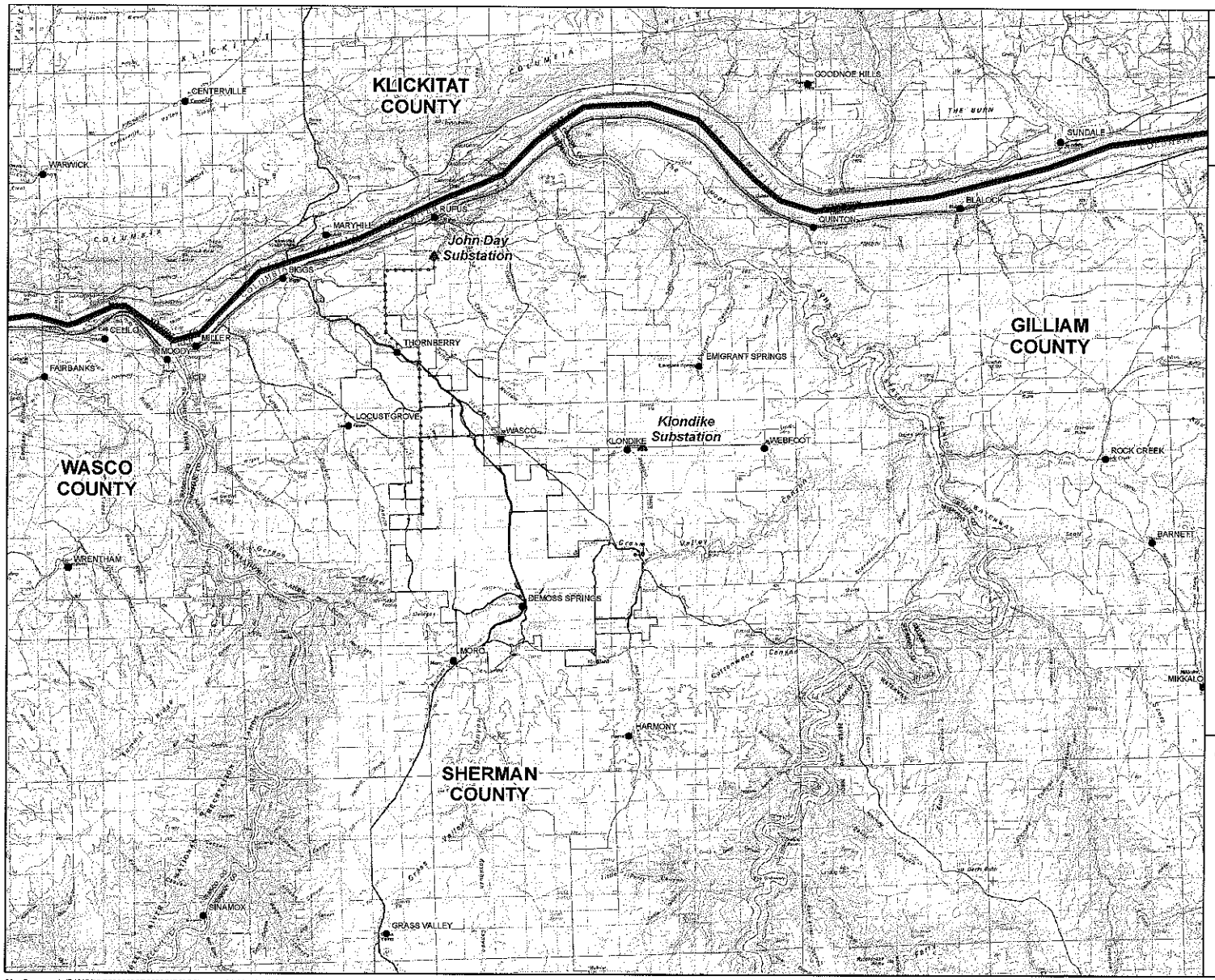
The Project would deliver electric power at two separate interconnection points as shown on Addendum Figure C-2. The easterly turbine arrays would be connected to a collector substation in the southeast corner of the Project. That collector substation would be connected to the existing PPM Energy's transmission line, which connects to BPA's system on the north side of the Klondike Schoolhouse Substation via a new above ground transmission line. The westerly and northern turbine arrays would be connected to a substation on the west side of the Project. That collector substation

would be connected to BPA's John Day Substation via a new above ground transmission line.

Two separate locations for the O&M facility are under consideration, only one of which will be constructed. One location is central to the turbine arrays near state Highway 97. The alternate location is in the southeast corner of the Project at the intersection of Nish Road and Woods Lane. The local electric service provider for both locations is Wasco Electric Cooperative. Local electric service to the O&M building near Highway 97 would likely be provided by an extension of the distribution line that currently serves a residence, a distance of about 5/8 mile along roadways. The prospective O&M facility location in the southeast corner of the Project is already served by an electric distribution line on Woods Lane, so there should not be any need for significant new construction.

There is no gas pipeline or water supply pipeline associated with this Project.

FIGURES

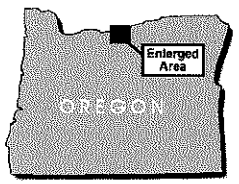


Golden Hills Wind Project
Addendum to Exhibit C

FIGURE C-1
Project Vicinity

Legend

- ▲ Approximate Substation Locations
- Transmission Line
- State Boundary
- County Boundary
- Lease Area



N

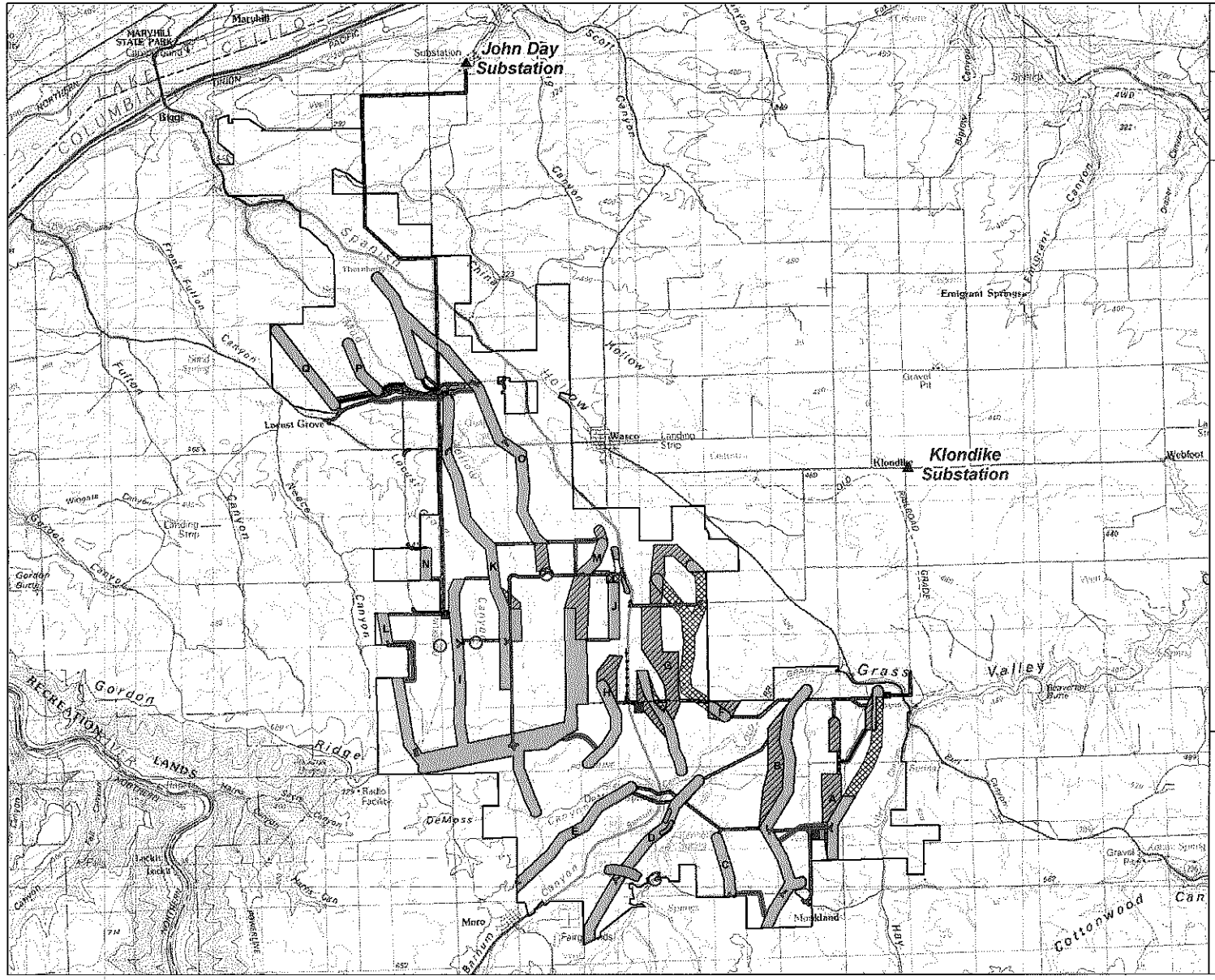
0 2 4 6 8
Miles

Data Sources:

30x60 USGS Quadrangles:
Condon, OR 1981
Goldendale, OR-WA 1980
Hood River, OR-WA 1982
Toppenish, WA 1979

Oregon Geospatial Enterprise Office (GEO)

Map Document: (P:\B\BPOC00000005\0600INFO\GS\aremap\Addendum\Fig_C-1_ProjectVicinity_Addendf_031808.mxd)
4/1/2008 – 10:15:18 AM



Golden Hills Wind Project
Addendum to Exhibit C

FIGURE C-2
Wind Farm Facilities

Legend

- ▲ Approximate BPA Substation Locations
- Transmission Line
- Underground Collector
- Crane Path and Underground Collector
- Crane Path
- New Road
- Existing Road Improvement
- Connector Corridors
- Bridge area
- Laydown
- O&M Building
- Substation
- Lease Area
- REVISED Corridors
- Additional Corridor
- Removed Corridor

N

0 0.8 1.6 2.4 3.2
Miles

Data Sources:

30x60 USGS Quadrangles:
Condon, OR 1981
Goldendale, OR-WA 1980
Hood River, OR-WA 1982
Toppenish, WA 1979

Oregon Geospatial Enterprise Office (GEO)

Map Document: (P:\BIBPOC0000000\B0600\INFO\GS\arcmap\Addendum\Fig_C-2_Facilities_Addend1_072908.mxd)
7/30/2008 – 1:03:30 PM

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: May 2008
TO: Kelly O'Brien
FROM: Dana Siegfried
SUBJECT: **Addendum to Exhibit E**
PROJECT: Golden Hills Wind Project
PROJECT NO: BPOC0000-0005
COPIES:

Section E.6 Third Party Permits of the EFSC permit for the Golden Hills Wind Project has been revised as specified below:

E.6 THIRD-PARTY PERMITS

OAR 345-021-0010(1)(e)(E) *If the Applicant relies on a state or local government permit or approval issued to a third party, identification of any such third-party permit and for each:*

(i) *Evidence that the Applicant has, or has a reasonable likelihood of entering into, a contract or other agreement with the third party for access to the resource or service to be secured by that permit;*

(ii) *Evidence that the third party has, or has a reasonable likelihood of obtaining, the necessary permit; and*

(iii) *An assessment of the impact of the proposed facility on any permits that a third party has obtained and on which the Applicant relies to comply with any applicable Council standard.*

Previous Response: The Applicant will not rely on any third party permits in order to construct or operate the Project.

Revised Response (March 28, 2008): The project transmission line will connect with the third party permitted sub-station and transmission line associated with the Hay Canyon Wind Farm developed by Pacific Wind Development LLC, a wholly-owned subsidiary of PPM Energy, Inc. Hay Canyon Wind Farm has received a conditional use permit (CUP) from Sherman County. A signed copy of the CUP is attached. No impacts to permits held by the Hay Canyon Wind Farm project are anticipated to result from this agreement.

File Name: P:\B\BPOC00000005\0600INFO\0670Reports\0672 - Application for Site Certificate\Addendum\Addendum 1 Exhibit E draft.doc

SHERMAN COUNTY PLANNING COMMISSION ORDER

IN THE MATTER OF A CONDITIONAL USE PERMIT APPLICATION FOR HAY CANYON WIND FARM, PPM ENERGY	SHERMAN COUNTY PLANNING COMMISSION FINDINGS AND DECISION

SECTION 1. PROCEDURAL FINDINGS

1.1 Pacific Wind Development LLC ("Applicant"), a wholly-owned subsidiary of PPM Energy, Inc., filed a conditional use permit ("CUP") to allow the construction and operation of up to a 105 megawatt ("MW") wind energy generation facility in Sherman County, Oregon ("County") (known as the Hay Canyon Wind Farm and hereafter referenced as "Hay Canyon" or the "Project").

1.2 Hay Canyon is proposed for property located seven miles southeast of Wasco, Oregon and near highway 206 and Baseline Road, and more specifically described as Tax Lots 4900 and 6300 in Township 1 North, Range 18 East and Tax Lots 700, 800, 900, 1000, 1700, 1900, 2000, 2100, and 3100 in Township 1 South, Range 18 East, Sherman County, Oregon (the "Project Site").

1.3 The Project Site is zoned Exclusive Farm Use ("EFU"). Hay Canyon would occupy approximately 34 total acres, including new roads.

1.4 The application for the requested CUP was deemed complete, and the Planning Staff subsequently issued a Staff Report dated September 10, 2007, recommending Conditions of Approval if the Planning Commission approves the CUP, with proposed conditions. Notice of the Planning Commission hearing was advertised in The Dalles Chronicle on August 29, 2007, and mailed to surrounding property owners prior to that date. The Planning Commission held a public hearing on September 17, 2007. The record was held open for additional written evidence and arguments until September 24, 2007, and additional rebuttal evidence and arguments until October 1, 2007. The Applicant submitted additional nonevidentiary arguments pursuant to applicable statute by October 8, 2007.

1.5 Article 5 of the Sherman County Zoning, Subdivision, Partitioning, and Land Development Ordinance of 1994 ("SCZO") establishes the approval criteria and procedural requirements for approving a CUP. The application must meet the following general criteria in SCZO 5.2:

A. The proposal is compatible with the County Comprehensive Plan and applicable Policies.

B. The proposal is in compliance with the requirements set forth by the applicable primary Zone, by any applicable combining zone, and other provisions of the SCZO that are determined applicable to the subject use.

C. For a proposal requiring approvals or permits from other local, state, and/or federal agencies, the Applicant must provide evidence of such approval or permit compliance can be assured, or is established, prior to final approval.

D. The proposal is in compliance with specific standards, conditions and limitations set forth for the subject use in Article 5 and other specific relative standards required by this or other County ordinances.

E. No approval may be granted for any use which is or expected to be found to exceed resources or public facility carrying capacities, or for any use which is found to not be in compliance with air, water, land, and solid waste or noise pollution standards.

F. That no approval be granted for any use violation of this Ordinance.

SECTION 2. CUP FINDINGS

2.1 The applicable Comprehensive Plan goals and policies are found in Section VIII (Public Process), Section XI (Physical Characteristics), Section XII (Social Characteristics), Section XIV (Economics), and Section XV (Energy). For the following reasons, the Project is consistent with the applicable Comprehensive Plan goals and policies and satisfies SCZO 5.2(1).

2.1.1 The Project is consistent with Section VIII, Finding 1, Goal I as there has been a public process that has allowed citizens and effected agencies to participate in the planning process. Notice of the proposal was published on August 29, 2007, and mailed to surrounding property owners prior to that date. Public testimony was received during the September 17, 2007 Planning Commission meeting, and the public was given an opportunity to submit additional written testimony before September 24, 2007.

2.1.2 Section XI goals and policies address the importance of maintaining the existing quality of the physical environment and preserving its attributes as well as ensuring that statewide planning goals, specifically Goals 3, 5, 6, and 7, are satisfied. Construction will be conducted pursuant to an NPDES 1200-C and Applicant will implement best management practices for minimizing erosion potential during construction. The Project requires less than 5,000 gallons per day of groundwater and qualifies for an exempt groundwater well. The limited groundwater use will have no permanent impact to groundwater resources. No upland tree habitat will be permanently or temporary affected and all impacts will be avoided. Finally, avian and biological studies demonstrate that the project will

not significantly impact fish or wildlife habitat. On this basis, the applicable Section XI goals, including Goal I, Goal V, Goal VI, and Goal VII are met.

2.1.3 Section XII goals and policies address public facilities and services, transportation, and cultural and historic resources. Roads will be located to minimize disturbance and maximize transportation while avoiding sensitive resources and unsuitable topography. All roadwork will be conducted in accordance with the Project's NPDES 1200-C permit under which appropriate erosion control measures will be implemented. The permanent roads will be up to 20-feet wide and constructed in coordination with County road master. Development of the Project increases the County's economic diversity. Applicant proposes to utilize local construction companies and aggregate resources during construction. The Project will also result in substantial annual tax revenue for the County. A cultural resource survey demonstrated that there are no resource sites previously identified on the Project Site or adjacent properties. The Project will not impact the Oregon Trail. For these reasons, Section XII goals and policies are satisfied.

2.1.4 Section XIV addresses economics, specifically diversity of the economic base and conservation of agricultural lands. The Project is consistent with the Exclusive Farm Use (EFU) zone, which allows for the construction and operation of commercial utility facilities as a conditional use. The Project will result in only 34 acres of EFU land being removed from agricultural use. The minimal loss of farm income based on the limited amount of the land the project proposes to withdraw from farm production will be more than offset by revenue to local farms from wind turbine leases. Additionally, a number of temporary construction jobs may be filled with local personnel. The County's tax base will increase significantly by revenues generated from the Project and approximately 6 to 10 permanent operations and maintenance jobs will be added to the community. For these reasons, Section XIV goals and policies are met.

2.1.5 Section XV addresses energy, and the County has recognized that it has solar and wind resources that have not been utilized. Wind facilities do not emit greenhouse gases or particulates, do not produce hazardous wastes, and will not deplete other natural resources. The Project involves the development of renewable resources. Thus, Section XV energy goals and policies are satisfied.

2.2 The Project is consistent with the applicable provisions set forth in the EFU-base zone. The Project Site is not subject to overlay or combing zones. The Project falls within the definition of commercial utility facility, which is permitted in the EFU zone as a conditional use. The EFU zone sets forth specific dimensional standards that apply to all development. The Project satisfies all the dimensional standards, including setbacks, because the turbine pads and turbines will be placed at least 400 feet from each property line. The current applicable setback provisions require 30 feet from the property line for front and rear yard setbacks (or 50 feet from the front property line when from an arterial or major collector), and 25 feet from the property line for the side yard setbacks (or 50

feet when the adjacent lot involves a non-farm residential use). Applicants propose 400 feet setbacks for the turbines (measured from the property line to the turbine-pad center), which is sufficient to ensure that the project does not result in adverse impacts to adjacent properties. The maintenance facility will also comply with required setbacks. In addition to the specific EFU criteria, the Project is subject to applicable state and federal rule and regulations. Applicant has filed a notice of proposed construction or alteration with the Federal Aviation Administration (FAA) and will provide the County with the FAA's response. Applicant also has consulted with the Oregon Department of Fish and Wildlife ("ODFW") about potential impacts on birds and wildlife species, although such consultation was not specifically required. The Project will comply with all applicable Oregon noise rules. For these reasons, the Project is consistent with the applicable criteria in SCZO 3.1, governing uses in the EFU zone, and SCZO 4.9, requiring compliance with all state and federal agency rules and regulations. SCZO 5.2(2) is satisfied.

2.3 Applicant provided evidence demonstrating that the applicable approvals or permits from other local, state, and/or federal agencies can be obtained or assured prior to final approval of the CUP. Applicant submitted a notice of proposed construction or alteration to the FAA. The Project is located outside the FAA Imaginary Surfaces (defined by Federal Aviation Regulation Part 77) for the Wasco State Airport. There is sufficient evidence to demonstrate that the FAA will accept the notice for the proposal. For state approvals, Applicant will apply for a NPDES 1200-C permit before construction and ensure that all DEQ noise standards are met. This is sufficient to assure the County that the applicable state and federal approvals or permits will be obtained, and therefore, SCZO 5.2(3) is met.

2.4 To be approved, the Project must also be consistent with specific standards, conditions, and limitations for non-farm uses on EFU land. Pursuant to SCZO 5.8(20) non-farm uses must (i) be compatible with the farm uses described in ORS 215.203(2); (ii) not interfere seriously with accepted farming practices on adjacent land devoted to farm use; (iii) not materially alter the overall land use pattern of the area; (iv) be situated upon generally unsuitable land for the production of farm crops and livestock, considering the terrain, adverse soil or land conditions, drainage and flooding, vegetation, location and size of the tract, and availability of necessary support resources for agriculture; (v) comply with other applicable significant resource provisions; and (vi) comply with such conditions as the County deems necessary.

2.4.1 ORS 215.203(2)(a) defines "farm use" in part as "the current employment of land for the primary purpose of obtaining a profit in money by raising, harvesting, and selling crops." The Project Site and adjacent property is used for wheat farming. Only 34 acres of land will be removed from farm use, none of which is classified as high-value farmland. Applicant proposes steps to minimize disruption to farming practices. Turbines and transmission interconnection lines will be placed along the margins of cultivated areas where possible, and Applicant is working with the County weed officer to develop a plan to minimize the potential invasion by weed species. The road improvements will improve access to farm uses and

the temporary increase in traffic during construction will be managed in coordination with the County road master. The Project is consistent with the purposes of the EFU zone and as proposed, is compatible with farm uses.

2.4.2 "Accepted farming practices" is defined in ORS 215.203(2)(c) as "a mode of operation that is common to farms of a similar nature, necessary for the operation of such farms to obtain a profit in money, and customarily utilized in conjunction with farm use." The Project Site and adjacent property is used for wheat farming. Some plowing, harvesting, and crop-dusting patterns may be modified to account for the location of the turbine pads and turbines. Applicant has communicated with County crop dusters and leasehold landowners regarding aerial spraying, and the crop dusters do not anticipate any problem with continued spraying. Leasehold landowners already manually apply spray around fence lines to cover surface areas missed during crop dusting. A similar method will be used for areas near the turbines that the crop duster misses. The road improvements will not seriously interfere with accepted farming practices, including moving equipment along local roads. Applicant will coordinate with the County road master to ensure adequate coordination and new roads will improve access to farm uses. For these reasons, the Project does not seriously interfere with accepted farming practices on adjacent lands devoted to farm use.

2.4.3 The Project will not materially alter the overall land use pattern of the area. The surrounding area is in farm use. The Project is consistent with the EFU zone and will not significantly interfere with accepted farm uses. It will only remove approximately 34 acres from farm uses, representing a very small percentage of agricultural lands in the County. Any impact associated will the Project will not amount to a material impact so as to alter the overall land use pattern of the area.

2.4.4 The Project Site was selected because of its topography and the availability of the wind resource. The land is not high-value farmland, and there is an abundance of agriculture and open space in the County that provide the necessary support resources for agricultural uses. The land is more suitable for a wind-energy production site when considering the availability of wind resources and the highest and best use. Therefore, SCZO 5.8(20)(4) is met.

2.4.5 There are no other applicable significant resource provisions in SCZO that have not already been addressed and met. Therefore, SCZO 5.8(20)(5) is satisfied.

2.4.6 Conditions of approval are imposed as necessary under SCZO 5.3, and Applicant is obligated to satisfy the conditions. The Project thus satisfies SCZO 5.8(20)(6).

2.5 An approval may not be granted for any use which is, or expected to be found, to exceed resource or public facility carrying capacities, or for any use which is found to not be in compliance with air, water, land, and solid waste or noise pollution standards. Applicant must obtain an NPDES 1200-C permit and comply with DEQ noise standards. The Project results in no air emissions and any wastewater will be discharged to an on-site

septic system meeting applicable County standards. The Project will not exceed resource or public facility carrying capacities given the Project's limited impact on air, water and land resources and dependence on public facilities. Applicant proposes road improvements to reduce impacts to local roads. For these reasons, approval is appropriate subject to conditions of approval, and SCZO 5.2(5) is met.

2.6 There is no existing violation of SCZO. The Project does not violate any use in SCZO. Therefore, SCZO 5.2(6) is met.

SECTION 3. DECISION

Based upon the forgoing Findings of Fact, the requested conditional use permit is approved subject to the following conditions.

SECTION 4. CONDITIONS OF APPROVAL

4.1 The conditional use permit approval is contingent upon the County Court adopting a Goal 3 exception for the Project Site and amending the Comprehensive Plan.

4.2 Applicant will submit a revised site plan of Operations and Maintenance Building to include the actual size and location of the building.

4.3 Applicant will record a Farm Management Easement(s) on the property on which it locates wind power generation facilities.

4.4 Applicant will remove from Special Farm Assessment the property on which it locates the Hay Canyon Wind Farm and will pay all property taxes due and payable after the Special Farm Assessment is removed from such property.

4.5 Applicant will comply with all applicable government permit and approval requirements, and:

A. Work with the Sherman County Weed Control manager to take appropriate measures to prevent the invasion, during and after the project's construction, of any weeds on the Sherman County noxious weed list.

B. Comply with the Federal Aviation Administration's requirements for installing and operating lighting on the turbines.

C. Cooperate with the Sherman County Road Department to ensure that any unusual damage or wear caused by the use of the County's roads by the developer during the construction of the project will be the responsibility of the developer. The Road Department will provide an assessment of road conditions in the project area prior to the start of construction of the project and an evaluation of the roads following completion of the project to determine any significant change in condition. In addition, no equipment or machinery of the developers shall be

parked or stored on any county road except while in use. See item 4.8 of this section for additional requirements.

4.6. Within 6 months after the wind turbines, or any replacement wind turbines, are abandoned, Applicant or the property owner at Applicant's or the property owner's expense, will decommission and remove the wind turbines and wind turbine towers. Abandonment does not include temporary curtailment of operations due to market conditions, equipment repair or replacement, or other similar interruptions in operations.

4.7 Applicant will implement the fish and wildlife measures the Applicant proposed, which are included in the Biological Summary Report included with the CUP application and as further set forth in its September 19, 2007 letter. A subsequent letter from ODFW to Sherman County, dated September 24, 2007 acknowledges the applicant's proposal as satisfactory. Both letters are attached to this order.

4.8 Prior to beginning construction, Applicant will (a) designate a route or routes for the transport of wind turbine construction material (including water, aggregate, concrete, machinery, and tower pieces), with the intention of minimizing damage to non-designated roads, and provide these designations to the County Road Master; (b) provide to the County Road Master a written summary of possible, anticipated road damage to the designated route or routes, and an estimate of the cost of repair to the designated route or routes; (c) establish and maintain an escrow account for so long as construction is ongoing funded in an amount equal to the estimated cost to repair the designated route or routes consistent with the estimate provided in (b) above; and (d) conduct an inspection of the roads along the designated route or routes before and after construction with a representative of the Sherman County Road Department and an independent third party with the required expertise to inspect and evaluate paved and graveled roads. In the event a dispute arises, the third party shall be the final arbiter. The cost of the hiring of the third party shall be borne by the applicant.

4.9 Applicant will comply with OAR 340-035-0035 regarding noise requirements for wind projects.

APPROVED THIS 10th Day of December, 2007

Donald L. Richelderfer

Don Richelderfer, Chairman

Sherman County Planning Commission

ATTEST:

Georgia L Macnab

Georgia Macnab, Planning Director
Sherman County

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: May 2008
TO: Kelly O'Brien, BP Alternative Energy
FROM: Ethan Rosenthal
SUBJECT: **Addendum to Exhibit F**
PROJECT: Golden Hills Wind Project
PROJECT NO: BPOC0000-0005
COPIES: file

Table F-1 of Section F.1 Property Ownership of the EFSC permit for the Golden Hills Wind Project has been updated to account for two new properties within the expanded project foot print. The new parcels are located interior to the prior foot print and therefore property ownership within 500 feet of the project has not changed:

Table F-1: Property Ownership Within Project Site

Landowner Names	Addresses	
Joseph A. and Dianne M. Abbas	92740 Hwy 206	Wasco, OR 97065
Betty Suzanne Alt, et al.	1050 Marian Drive	Homer, NY 13077
Karl F. Amidon, et al.	202 Knight Road	Goldendale, WA 98620
Leland Anderson	3445 Dogwood Drive S	Salem, OR 97302
Stanley Anderson	10630 SE Clay #403	Portland, OR 97216
Bruce Andrews, Trustee	8563 SE Kane Road	Gresham, OR 97080
The Barnett EST Partnership	P O Box 273	Wasco, OR 97065
Norma M. Barzee	790 SE Webber Unit 102	Portland, OR 97202
James R. and Jerrine Belshe, Trustee	P O Box 327	Wasco, OR 97065
Douglas R. Bish	P O Box 13	Wasco, OR 97065
Scott Blau, et al	314 2nd Street	Lake Oswego, OR 97034
Orville and Shirley Blaylock	68808 Hwy 97	Moro, OR 97039
Keith Blaylock	68779 Van Gilder Road	Wasco, OR 97065
Kevin Bonness	2643 Turnstone Drive	Pleasonton, CA 94566-5341
Sandra Bredeson	34005 Mallard Avenu	Nehalem, OR 97131
Steven F. Burnet, Trustee	94699 Monkland Road	Moro, OR 97039
Geraldine Carroll, et al.	77402 Desert Road	Hermiston, OR 97838
Bon Christianson	10505 N Sage Hollow Way	Boise, ID 83714-9575
Larry Clark	131 Canyon Gate Lane	Selah, WA 98942
Marilyn Clark	1502 W Eugene Street	Hood River, OR 97031

Table F-1: Property Ownership Within Project Site

Landowner Names	Addresses	
Marilyn Jane Clark	8395 SW 88th	Portland, OR 97223
Reatha S. Coats	P O Box 45	Wasco, OR 97065
Gloria F. Cockburn, et al.	10776 SE Idleman Road	Portland, OR 97266
Denice C. Davies, ET VIR	1611 NE Gertz Road	Portland, OR 97211
John and Carolyn DeMoss	70620 Hwy 97	Moro, OR 97039
John E. and Vada J. DeMoss	P O Box 246	Moro, OR 97039
James Dunn and David Dunn	9695 Lower Bridge	Terrebonne, OR 97760
John and Nancy Fields	75960 Hwy 97	Wasco, OR 97065
Michael Foss	23826 SE 47th Place	Issaquah, WA 98029
James Fulton Trust / Farm, Ranch & Timber Asset Management	428 W. Riverside Avenue, Suite 700	Spokane, WA 99201
Alan Hart	3989 Viewcrest Drive S	Salem, OR 97302
Darryl Hart	63461 Fraser Road	Moro, OR 97039
Kenneth Hart, Trustee	63461 Fraser Road	Moro, OR 97039
Georgie Belle Holzapfel	77402 Desert Road	Hermiston, OR 97838
Irwin Mortgage Group	10500 Kincaid Drive	Fishers, IN 46038
Jean McIntyre Joyce, et al.	1047 Lucky Lane	Ontario, OR 97914
Justesen Ranches	P O Box 2	Kent, OR 97033
J. Kenneth Kaseberg, GST Trust	1670 Edgewood Drive	Palo Alto, CA 94303
Lee and Karen Kaseberg	70031 Van Gilder Road	Wasco, OR 97065
Lee C. and Terry D. Kaseberg	70031 Van Gilder Road	Wasco, OR 97065
Paulen W. Kaseberg, Trustee	P O Box 126	The Dalles, OR 97058
Steven and Deeann Kaseberg	92883 Locust Grove Lane	Wasco, OR 97065
Terry and Diane Kaseberg	93431 Hwy 206	Wasco, OR 97065
Jo Anne Kock	1817 Feather Way	Las Vegas, NV 89108
Sandra Loop	3302 Royal Crest Drive	The Dalles, OR 97058
Peter J. Macnab, Trustee	708 Yates	Wasco, OR 97065
Tom and Georgia Macnab	66330 Henrichs Road	Moro, OR 97039
Carole Makinster Living Trust	P O Box 353	Moro, OR 97039
Patricia Malen	9030 NE 33rd Street	Yarrow Point, WA 98004
Martin Brothers Land	P O Box 128	Rufus, OR 97050
Patrick K. Martin	5343 Ayres Way	The Dalles, OR 97058
Mike and Jeanney McArthur	93350 Foss Lane	Wasco, OR 97065
L. P. McClennan	P O Box 215	Wasco, OR 97065

Table F-1: Property Ownership Within Project Site

Landowner Names	Addresses	
Thomas and Nancy McCoy	93340 Hwy 206	Wasco, OR 97065
Wendy McDermid Parker	27640 Powerline Road	Halsey, OR 97349
Richard D. & Jean H. McGregor	10242 SE Walnut Drive	Portland, OR 97266
McIntyre Farm Partnership	1047 Lucky Lane	Ontario, OR 97914
Myrna L. Melzer	P O Box 342	Moro, OR 97039
Mid Columbia Producers, Inc.	P O Box 344	Moro, OR 97039
Dean C. & Jancie K. Monroe	P O Box 87	Moro, OR 97039
Morrow County Grain Growers	P O Box 367	Lexington, OR 97839
Frances M. O'Brien	96788 Hwy 206	Moro, OR 97039
Philip G. and William P. O'Meara	P O Box 1141	Redmond, OR 97756
Oregon Department of Transportation	355 Capitol Street NE, Room 434	Salem, OR 97301-3871
Nancy Perna	3688 Augusta National Drive S	Salem, OR 97302
Forest A. Peters, Trustee	69420 N Sawtooth Road	Wasco, OR 97065
Sara Petersen	15081 SE 126th Avenue	Clackamas, OR 97015
Mary Ann Pilgreen	P O Box 336	Helix, OR 97835
Allan Pinkerton	5002 Airport Road	Pendleton, OR 97801-4586
Bruce Pinkerton	P O Box 312	Moro, OR 97039
Dave Pinkerton	P O Box 302	Moro, OR 97039
Janet Pinkerton	P O Box 312	Moro, OR 97039
Margaret Pinkerton	P O Box 343	Moro, OR 97039
Harry Poole	826 41st Place NE	Salem, OR 97301
Diane E. Poston	P O Box 370	Moro, OR 97039
Patrick A. and Kathleen A. Powell	7580 SW Fulton Park Blvd	Portland, OR 97219
Judith Probstfield	13315 West Prospect Drive	Sun City West, AZ 85375
Keith and Christine Rice Trust / c/o Farm, Ranch & Timber Asset Management	428 W. Riverside Avenue, Suite 700	Spokane, WA 99201
Richelderfer-Bish c/o Dougals R. Bish	P O Box 13	Wasco, OR 97065
Richelderfer-Fordyce / Theron Richelderfer	P O Box 93	Wasco, OR 97065
Martin Richelderfer	P O Box 113	Wasco, OR 97065
Sylvia Rogers	2010 SW Nancy Drive	Gresham, OR 97080
Sharon A. Rolfe, et al.	414 NW 214th Circle	Ridgefield, WA 98642
H. C. Sanderson	91608 Biggs-Rufus Hwy.	Wasco, OR 97065
R. Gary Shelton, et al.	P O Box 311	Moro, OR 97039

Table F-1: Property Ownership Within Project Site

Landowner Names	Addresses	
John P. Shipley	P O Box 162	Moro, OR 97039
Edith Luetta Shull, et al.	P O Box 171	Wasco, OR 97065
Michael Sigman	37211 Floral Creek Circle	Murietta, CA 92562
Nancy J. Simpson	P O Box 370	Wasco, OR 97065
Phyllis Sisco	P O Box 62	Beaver, OR 97108
Larry and Sherry Kaseberg	69384 Wheatacres Road	Wasco, OR 97065
Patricia A. Skiles	504 Veterans Drive	The Dalles, OR 97058
Delmer A. and Margaret Smith	7611 Evergreen Road	Richland Hills, TX 76118
Debbie Spitzer	3405 Riverknoll Way	West Linn, OR 97068
Frances Diane Stewart	20806 Saratoga Road	Sonora, CA 95370-5423
Elizabeth Thomas, Trustee	3564 East 2nd Street #61	The Dalles, OR 97058
Carole Thompson	P O Box 353	Moro, OR 97039
Paula Thompson c/o UMESD Ken Thompson	2001 SW Nye	Pendleton, OR 97801
Ronald D. Thompson	66351 Hay Canyon Road	Moro, OR 97039
Donald Thompson, Trustee	96845 Monkland Lane	Moro, OR 97039
U.S. National Bank of Oregon, Trustee / May Barnum Trust / /c/o Farm, Ranch & Timber Asset Management	428 W. Riverside Avenue, Suite 700	Spokane, WA 99201
Arthur A. & Marjorie E. Van Gilder	P O Box 275	Wasco, OR 97065
Gary L Van Gilder	68192 Petes Road	Wasco, OR 97065
Raymond E. & Vera M. Van Gilder	512 Yates Street	Wasco, OR 97065
Phyllis K. Ullman	2833 NE 89th Avenue	Portland, OR 97220
Christine H. Walker	1111 Eric Court Way Apt 2A	The Dalles, OR 97058
Beth L. Webb	P O Box 97	Moro, OR 97039
Patricia Mae Welk	2880 NW Melville Drive	Bend, OR 97701
Leslie Wick	6825 SW Thunderbird Court	Redmond, OR 97756
Allison M. Yamauchi	4900 Crestwood Drive	Little Rock, AR 72207

Property Ownership Within 500 feet of Project Site

Landowner Names	Addresses	
Tom and Georgia Macnab	66330 Henrichs Road	Moro, OR 97039
Frances O'Brien	96788 Hwy 206	Moro, OR 97039
James and Jerrine Belshe	500 Sandon Street	Wasco, OR 97065
Larry and Carol Thompson	66680 Fairview Rd.	Moro, OR 97039
Weedman Ranches, Inc.	P.O. Box 386	Wasco, OR 97065
Edith Luetta Shull, Et.Al.	P.O. Box 171	Wasco, OR 97065
Patrick A. Powell	7580 SW Fulton Pk. Blvd.	Portland, OR 97219
Norma M. Barzee	790 SE Webber Unit 102	Portland, OR 97202
Sharon A Rolfe, Et.Al.	414 NW 214th Circle	Ridgefield, WA 98642
Peter J. Macnab, Trustee	608 Yates	Wasco, OR 97065
Terry and Diane Kaseberg	93431 Hwy 206	Wasco, OR 97065
Lee and Karen Kaseberg	70031 Van Gilder Rd.	Wasco, OR 97065
Thomas and Nancy McCoy	93340 Hwy 206	Wasco, OR 97065
Gary L. VanGilder	68192 Petes Road	Wasco, OR 97065
Mike and Jeanney McArthur	93350 Foss Lane	Wasco, OR 97065
Kevin and Particia Kaseberg	10500 Kincaid Drive	Fishers, IN 46038
Steven and Deeann Kaseberg	92883 Locust Grove Lane	Wasco, OR 97065
Particia Mae Welk	2880 NW Melville Dr.	Bend, OR 97701
H. M. Bull Ranch Partnership	P.O. Box 41	Redmond, OR 97756
Kenneth Hattrup	721 E 18th Street	The Dalles, OR 97058
Marie Teresa Hattrup-Revocable Living Trust	721 E. 18th Street	The Dalles, OR 97058
Warren F. Hemenway	63793 Fairview Rd	Moro, OR 97039
Neil F. McDonald, Trustee	3619 Knik Avenue	Anchorage, AK 99517
Mary P. Eakin	59059 Horseshoe Bend Rd	Grass Valley, OR 97029
Bruce Melzer	2704 SE 66th	Portland, OR 97206
Doug Melzer	31300 SE Countryview Ln	Wilsonville, OR 97070
Ken and Arla Melzer	66145 Fairview Rd	Moro, OR 97039

Property Ownership Within 500 feet of Project Site		
Landowner Names	**Addresses**	
Neil Melzer	P.O. Box 224	Moro, OR 97039
Vernon Melzer	P.O. Box 41	Wasco, OR 97065
Wayne Melzer	P.O. Box 342	Moro, OR 97039
Nancy Ann Land and Livestock, Inc.	17488 Franklin Rd	Nappa, OR 83651
Gary and Rhonda C. Miller	P.O. Box 134	Hermiston, OR 97838

File Name: P:\B\BPOC00000005\0600INFO\0670Reports\0672 - ASC Amendment 1\Amendment 1 Exhibit F draft.doc
Project Number: BPOC0000-0005

GeoEngineers

15055 SW Sequoia Pkwy, Suite 140, Portland, OR 97224, Telephone: (503) 624-9274, Fax: (503) 620-5940 www.geoengineers.com

MEMORANDUM

TO: Dana Siegfried and Blaine Graff, David Evans and Associates, Inc.

FROM: David Rankin, C.E.G., Principal

DATE: April 24, 2008

FILE: 12791-002-00

SUBJECT: Addendum to Exhibit H of the Golden Hills Wind Farm EFSC Submittal
Revised Turbine Corridor Locations

GeoEngineers, Inc. (GeoEngineers) performed a preliminary geologic and geotechnical study of the Golden Hills Wind Farm (GHWF) project area and prepared Appendix H of the Oregon EFSC Application for Site Certificate in July 2007.

Our services performed for the July 2007 Application included research of available data/reports and a visual reconnaissance of GHWF project area. In March of 2008, you provided us maps showing the revised turbine corridor locations and, based on these revisions, requested that GeoEngineers prepare a scope of work and cost estimate for any additional work required update the original Exhibit H prepared in July of 2007.

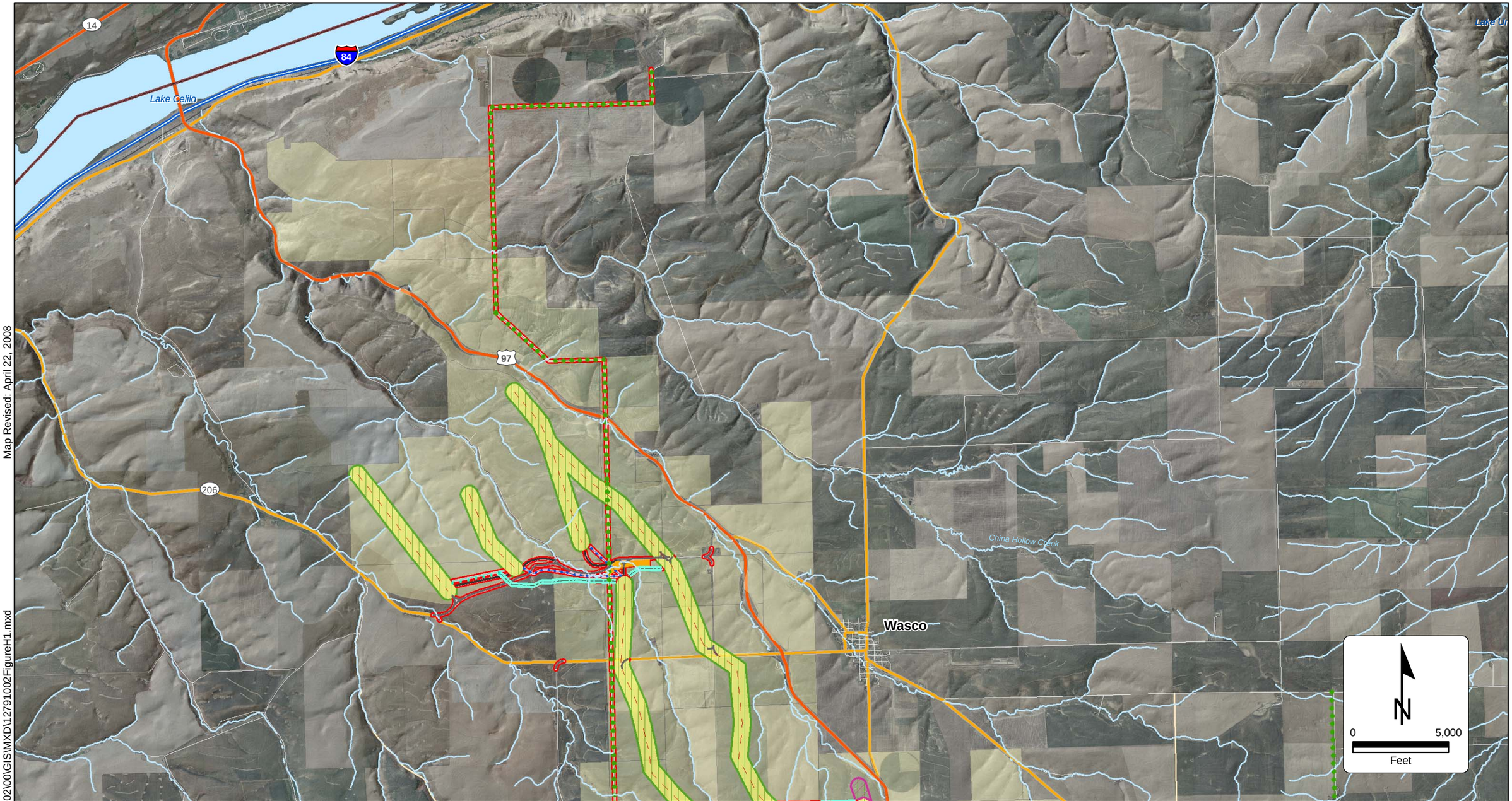
GeoEngineers reviewed the revised wind turbine corridor locations (see the attached Figures H-1A and H-2A). We concluded that no additional office data research was needed to update the original Exhibit H. However, a visual site reconnaissance was appropriate because some of the new corridors were situated on ridges not subjected to a visual reconnaissance by GeoEngineers in 2007. This site reconnaissance was conducted on April 14, 2008 by David Rankin, a Certified Engineering Geologist licensed in Oregon and the primary reviewer/author of the July 2007 Exhibit H.

Based on the above, the relocation of some of the wind turbine corridors does not materially alter the facts, conclusions, and recommendations presented in the July 2007 Exhibit H, presented as part of the Application for Site Certificate to the Oregon EFSC.

Please call or email (drankin@geoengineers.com) if you have any questions or comments.

Attachments: Figure H-1A – Detailed Site Map: North
Figure H-2A - Detailed Site Map: South

DKR:gaw
Port: P:\12\12791002\00\Finals\1279100200M_3.doc



Map Revised: April 22, 2008

Path: P:\12\12791002\00\GIS\MXD\12791002FigureH1.mxd

Office: PORT

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005. 2006 NAIP imagery from United States Department of Agriculture. Hillshade created from 10 Meter DEM obtained from Regional Ecosystem Office (REO). Corridor data provided by David Evans and Associates, Inc., February, 2008.

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Explanation

- Culvert
- Hydrology
- Connector Corridor
- Lease Area

Wind Turbine Corridors

- Additional Corridor
- Removed Corridor
- REVISED Corridors 020108
- Original Corridor

- Corridor Centerline
- Crane Path
- Underground Collectors and Crane Path
- County/State Road Improvements
- New Permanent Access Road
- Transmission Line
- Underground Collector

- Bridges
- Existing Bridges
- Equipment Lay Down Area
- Operations/Maintenance
- Project Substation

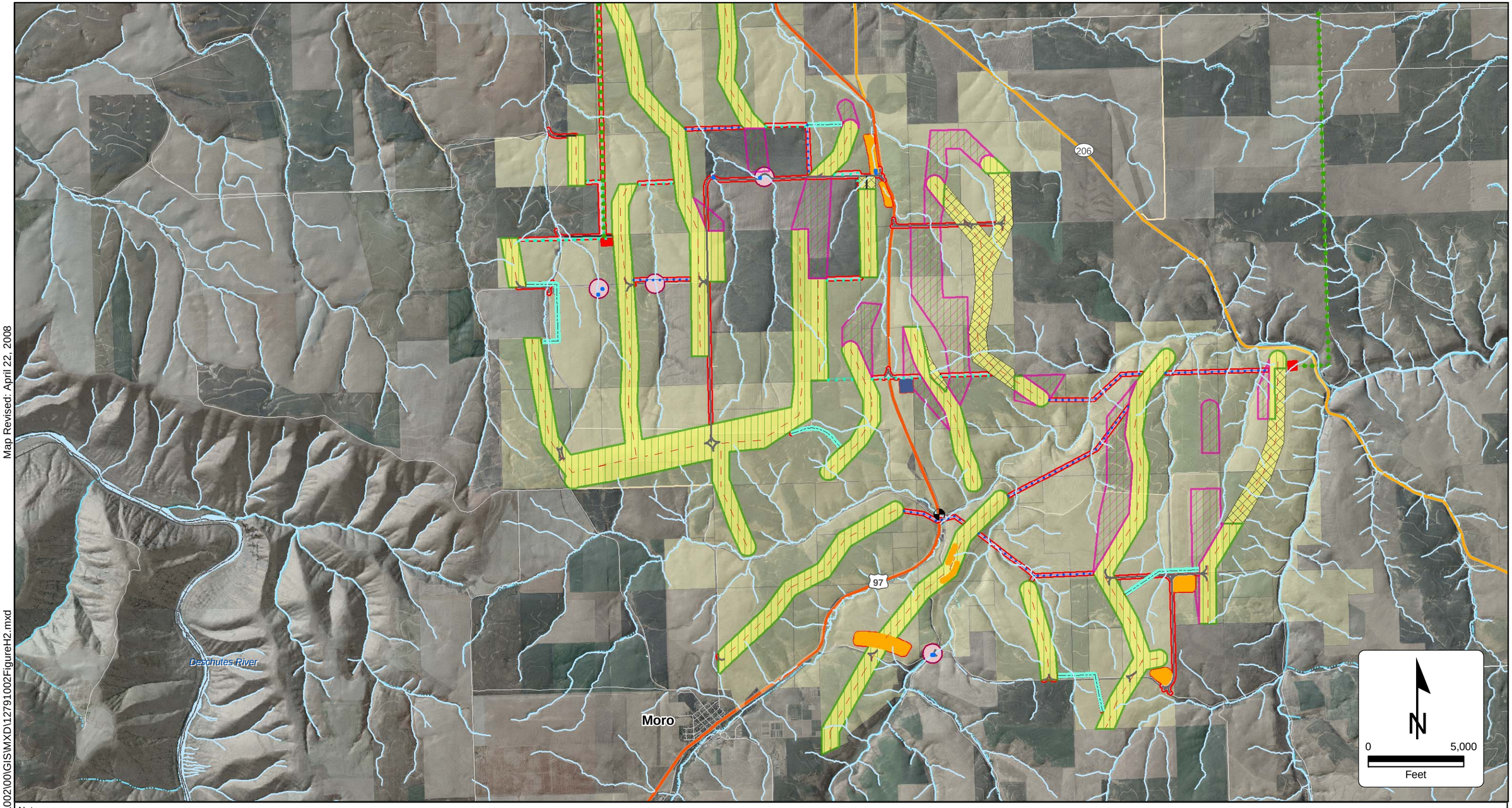
- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

Detailed Site Map: North

Golden Hills
Sherman County, Oregon

GeoEngineers

Figure H-1A



Map Revised: April 22, 2008

Path: P:\12\12791002\00\GIS\MXD\12791002FigureH2.mxd

Office: PORT

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005. 2006 NAIP imagery from United States Department of Agriculture. Hillshade created from 10 Meter DEM obtained from Regional Ecosystem Office (REO). Corridor data provided by David Evans and Associates, Inc., February, 2008.
Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Explanation

- Culvert
- Hydrology
- Connector Corridor
- Lease Area

Wind Turbine Corridors

- Additional Corridor
- Removed Corridor
- REVISED Corridors 020108
- Original Corridor

- Corridor Centerline
- Crane Path
- Underground Collectors and Crane Path
- County/State Road Improvements
- New Permanent Access Road
- Transmission Line
- Underground Collector

- Bridges
- Existing Bridges
- Equipment Lay Down Area
- Operations/Maintenance
- Project Substation

Streets and Highways

- Limited Access
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

Detailed Site Map: South

Golden Hills
Sherman County, Oregon

GeoEngineers

Figure H-2A

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: May 2008
TO: Kelly O'Brien
FROM: Ethan Rosenthal
SUBJECT: **Addendum to Exhibit I**
PROJECT: Golden Hills Wind Project
PROJECT NO: BPOC0000-0005
COPIES:

Disturbance acreages provided in Sections I.3 and I.4 have been changed due to adjustments in the project footprints. These exhibit sections are provided below, with the new acreage quantities provided.

I.3 IDENTIFICATION AND DESCRIPTION OF LAND USES

OAR-345-021-0010(1)(i)(B) *Identification and description of current land uses in the analysis area, such as growing crops, that require or depend on productive soils.*

Response: Land uses within and surrounding the site consist of private agricultural land generally used for dry land wheat production. Permanent project facilities will occupy approximately 127 acres of agricultural land and 12 acres of currently undeveloped non-agricultural land. Temporary impacts from construction will disturb an additional 1,036 acres of agricultural land and 347 acres of currently undeveloped non-agricultural land.

I.4 IDENTIFICATION AND ASSESSMENT OF IMPACTS TO SOILS

OAR 345-021-0010 (1)(i)(C) *Identification and assessment of significant potential adverse impact to soils from construction, operation, and retirement of the facility, including, but not limited to, erosion and chemical factors such as salt deposition from cooling towers, land application of liquid effluent, and chemical spills.*

Response: Unavoidable impacts to soils within the site boundary will result from placement of permanent project facilities such as gravel roads and concrete pads on approximately 141 acres. Additionally, facility construction will temporarily disturb soils on up to 1054 acres. These soil impacts will be limited according to the same methods identified in the ASC. Where temporary impacts would occur in cultivated areas, the approximately three feet of top soil would be salvaged and stockpiled in windrows. The windrows would be protected with plastic sheeting or mulch. Upon removal of temporary features, sub-soils would be cultivated to a depth of at least 12 inches (except where bedrock prohibits archiving this depth), then salvaged topsoil would be redistributed to match adjacent grades. There are no cooling towers or land

application of effluent. Because the quantities of chemical use will be minimal, the risk of spills is minor; appropriate measures will be taken to clean up and restore the area if any spill should occur.

File Name: P:\B\BPOC00000005\0600INFO\0670Reports\0672 - Application for Site Certificate\Addendum\Addendum 1 Exhibit I draft.doc

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: May 2008
TO: Kelly O'Brien, BP Alternative Energy
FROM: Ethan Rosenthal
SUBJECT: **Addendum to Exhibit J**
PROJECT: Golden Hills Wind Project
PROJECT NO: BPOC0000-0005
COPIES: file

This memorandum is an addendum to Attachment J-1: Wetland Delineation Report of the EFSC permit for the Golden Hills Wind Project. This addendum reflects additional study area that has been added to the Project. The additional study areas are shown in the attached revised Figures J-2 and J-3 (Sheets 1 to 5). Based on field visits conducted on April 3 and 4, 2008 no new wetlands or other waters of the State or U.S. were identified within the additional study areas. A brief discussion of methods and findings are provided below.

Methods

The April 3 and 4, 2008 wetland delineation field visit followed the same methods as described in Attachment J-1: Wetland Delineation Report. The Level 2 Routine On-Site Method was used to delineate wetland areas according to the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* herein referred to as the *Arid West Supplement*. This manual is designed as a supplement to the *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987).

All additional areas were reviewed and those areas with high probability of having wetlands or other waters were further investigated (i.e. depressional areas, ravines, areas mapped as drainages by the USGS).

Results

No new wetlands or other waters of the State or U.S. were identified. The majority of the additional area occurs along high plateau areas that are in dry land wheat production. No evidence of wetland formation occurs in these areas as they are well above the water table and the soils are readily drained. Four plots were recorded in ravines/areas mapped as drainages by the USGS. These areas have all been plowed through and no longer contain a channel with ordinary high water marks. Vegetation in these draws was either cultivated wheat or a variety of upland weed species. No primary indicators of wetland hydrology were observed and the soils are all non-hydric.

Attachments/Enclosures: Data sheets Plots 1-4, revised Figures J-2 and J-3 (Sheets 1 to 5).

File Name: P:\B\BPOC00000005\0600INFO\0670Reports\0672 - Application for Site Certificate\Addendum\Addendum 1 Exhibit J draft\Addendum 1 Exhibit J.doc

Golden Hills Wind Project
Addendum to Exhibit J

FIGURE J-1
Project Vicinity

Legend

- Approximate Substation Locations
- Transmission Line
- State Boundary
- County Boundary
- Lease Area

N

0 2 4 6 8

Miles

Data Sources:

30x60 USGS Quadrangles:
Condon, OR 1981
Goldendale, OR-WA 1980
Hood River, OR-WA 1982
Toppenish, WA 1979

Oregon Geospatial Enterprise Office (GEO)

Map Document: (P:\B\BPOC00000005\0600INFO\GS\arcmap\Addendum\Fig_J-1_ProjectVicinity_Addend1_031808.mxd)
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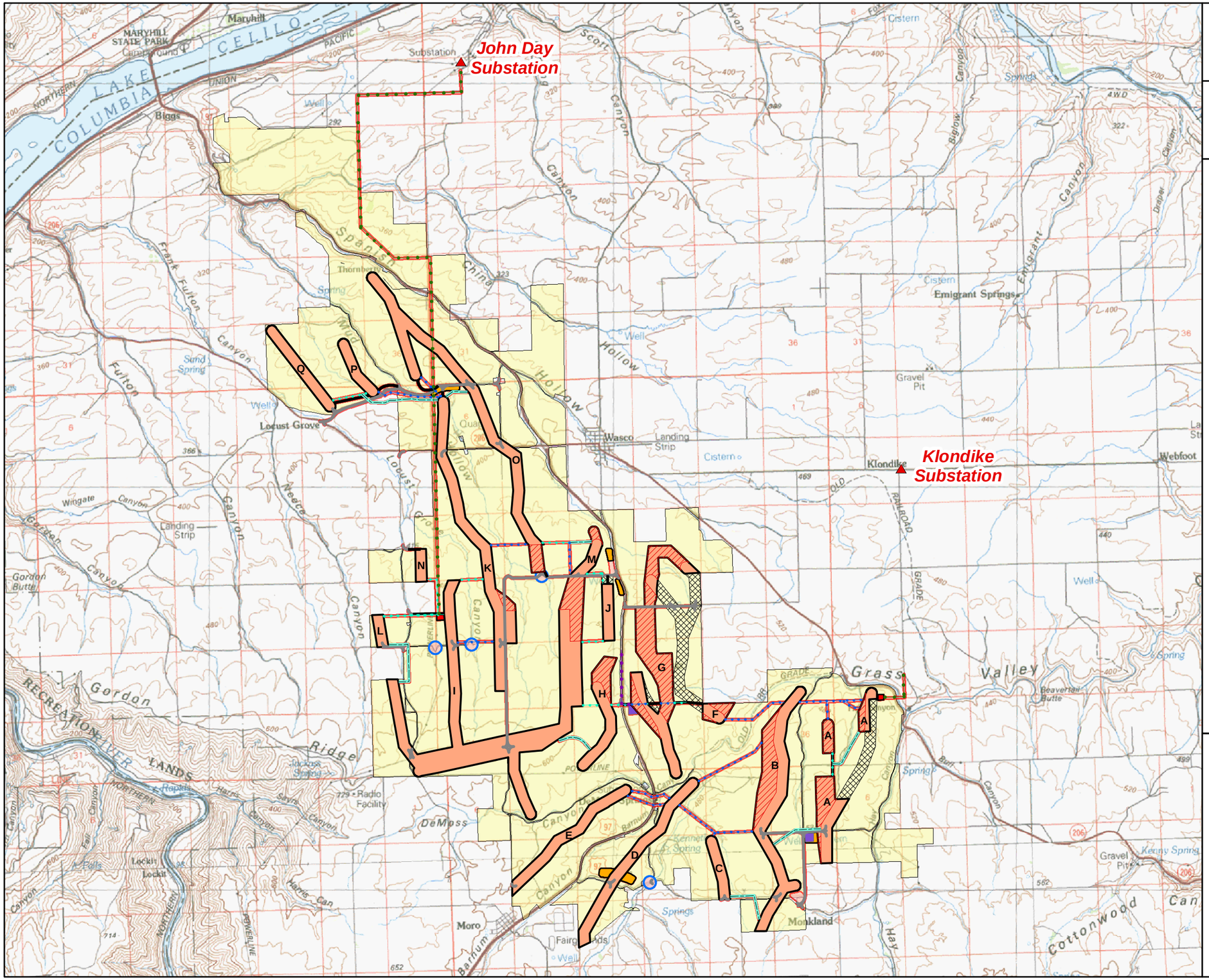
Golden Hills Wind Project
Addendum to Exhibit J

FIGURE J-2
Project Basemap



Legend

- Approximate BPA Substation Locations
- Transmission Line
- Underground Collector
- Crane Path and Underground Collector
- Crane Path
- New Road
- Existing Road Improvement
- Wasco Electric Distribution Lines
- Connector Corridors
- Bridge area
- Laydown
- O&M Building
- Substation
- Lease Area
- REVISED Survey Corridors
- Additional Survey Corridors
- Removed Survey Corridors

N

0 1 2 3 4
Miles

Data Sources:

30x60 USGS Quadrangles:
Condon, OR 1981
Goldendale, OR-WA 1980
Hood River, OR-WA 1982
Toppenish, WA 1979

Oregon Geospatial Enterprise Office (GEO)

Map Document: (P:\B\BPOC00000005\0600INFO\GS\arcmap\Addendum\Fig_J-2_Basemap_Addend1_031808.mxd)
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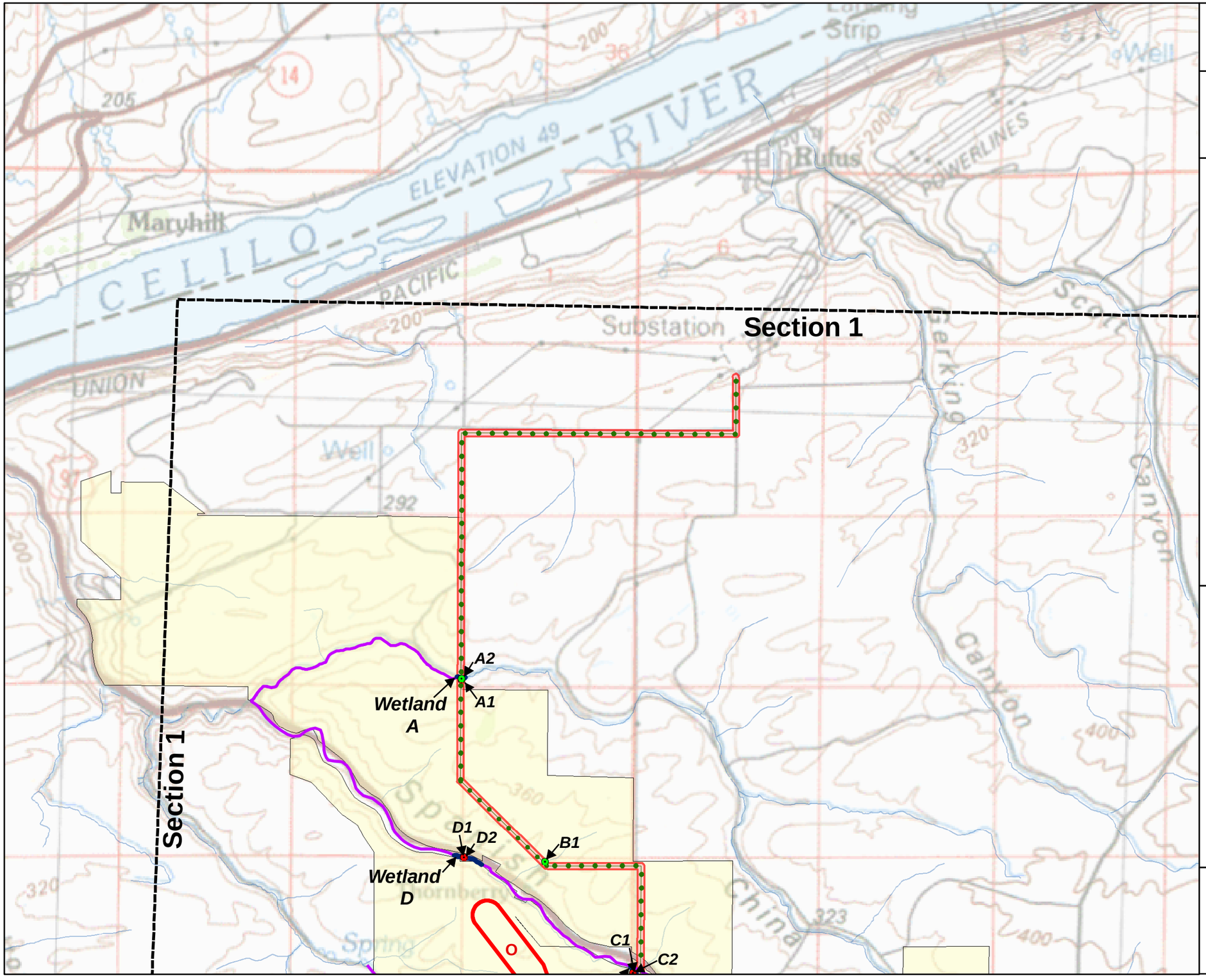
Golden Hills Wind Project
Addendum to Exhibit J

Figure J-3 (Sheet 1 of 5)

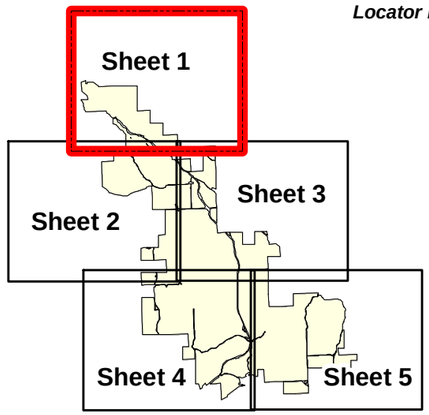
Data Plots and
Wetland Delineation



Legend

- Transmission Line
- Underground Collector
- Crane Path and Underground Collector
- Crane Path
- New Road
- Existing Road Improvement
- Waters of the U.S./State
- Bridge area
- Laydown
- O&M Building
- Substation
- REVISED Survey Corridors
- Additional Survey Corridors
- Removed Survey Corridors
- Connector Corridors
- Lease Area
- Wetland
- Bridge
- Culvert
- Wetland Data Plots
- Upland Data Plots

Locator Map



N

0 0.5 1

Miles

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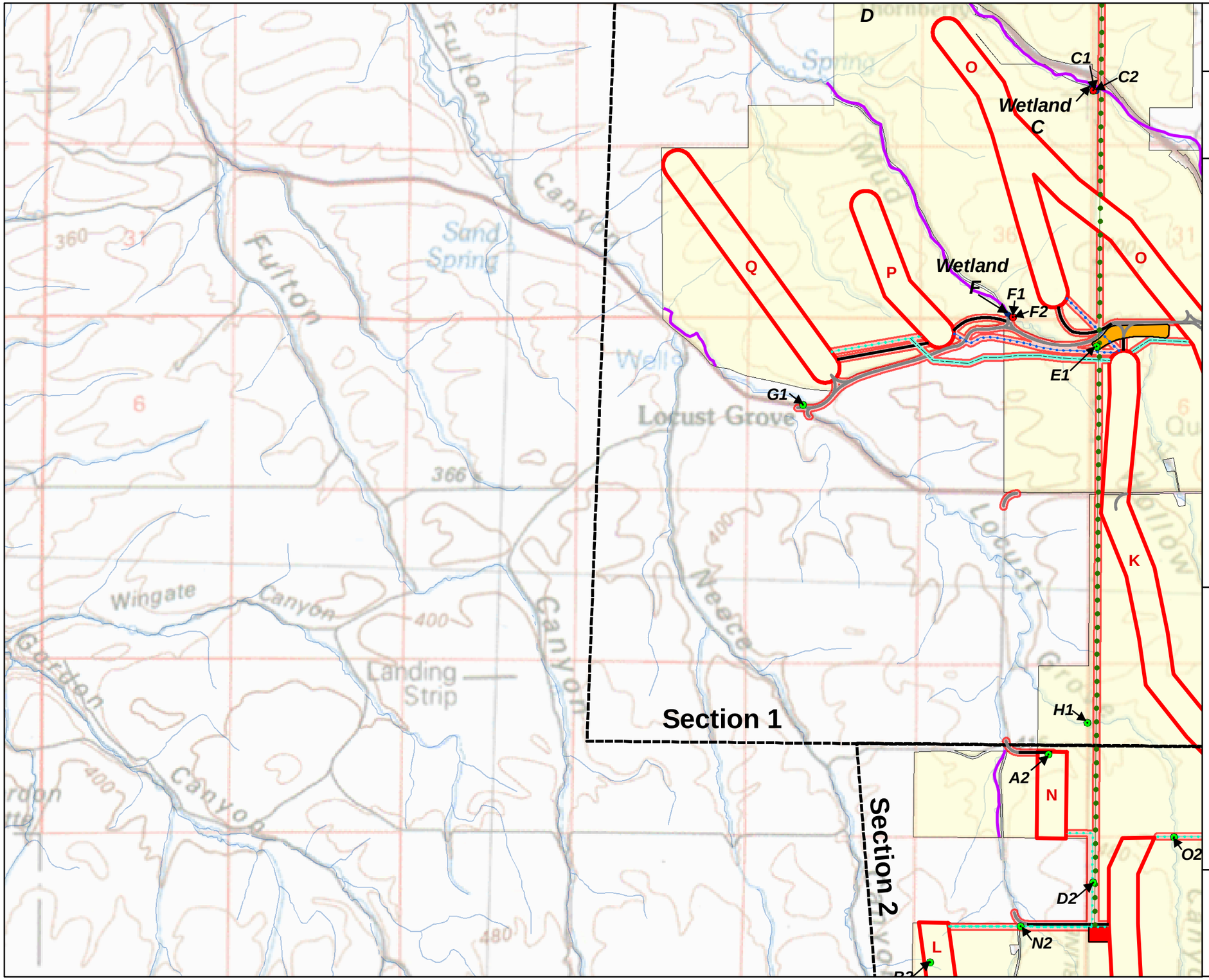
Golden Hills Wind Project
Addendum to Exhibit J

Figure J-3 (Sheet 2 of 5)

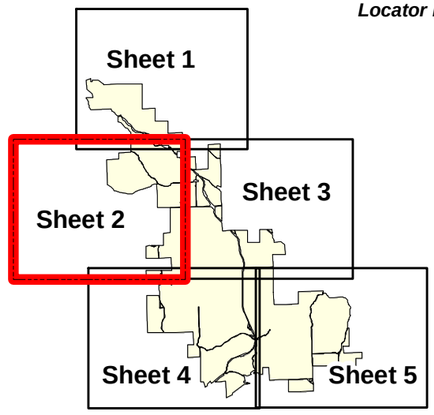
Data Plots and
Wetland Delineation



Legend

- Transmission Line
- Underground Collector
- Crane Path and Underground Collector
- Crane Path
- New Road
- Existing Road Improvement
- Waters of the U.S./State
- Bridge area
- Laydown
- O&M Building
- Substation
- REVISED Survey Corridors
- Additional Survey Corridors
- Removed Survey Corridors
- Connector Corridors
- Lease Area
- Wetland
- Bridge
- Culvert
- Wetland Data Plots
- Upland Data Plots

Locator Map



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Golden Hills Wind Project
Addendum to Exhibit J

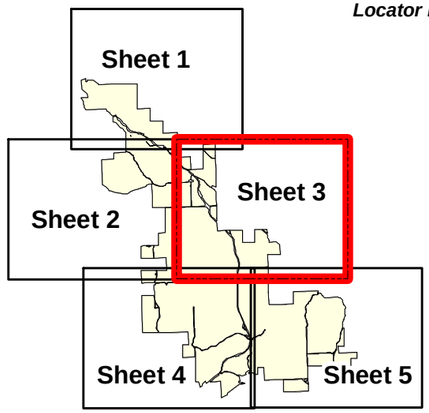
Figure J-3 (Sheet 3 of 5)

Data Plots and
Wetland Delineation

Legend

- Transmission Line
- Underground Collector
- Crane Path and Underground Collector
- Crane Path
- New Road
- Existing Road Improvement
- Waters of the U.S./State
- Bridge area
- Laydown
- O&M Building
- Substation
- REVISED Survey Corridors
- Additional Survey Corridors
- Removed Survey Corridors
- Connector Corridors
- Lease Area
- Wetland
- Bridge
- Culvert
- Wetland Data Plots
- Upland Data Plots

Locator Map



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0 0.5 1

Miles

Section 1

Section 2

Section 3

Wasco Landing Strip

Klondike

Well

Hollow

Cistern

Quarry

OLD RAILROAD

K

M

J

G

F2

K2

O2

G2

H1

H2

M2

L2

AD4

AD1

Y3

Wetland H

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Golden Hills Wind Project
Addendum to Exhibit J

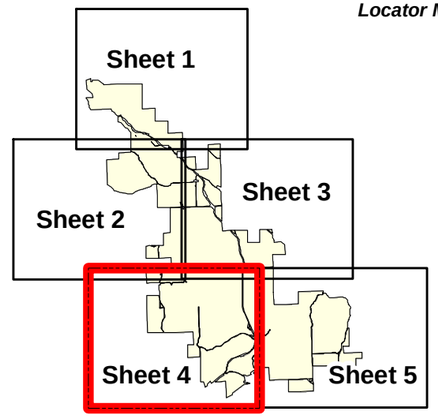
Figure J-3 (Sheet 4 of 5)

Data Plots and
Wetland Delineation

Legend

- Transmission Line
- Underground Collector
- Crane Path and Underground Collector
- Crane Path
- New Road
- Existing Road Improvement
- Waters of the U.S./State
- Bridge area
- Laydown
- O&M Building
- Substation
- REVISED Survey Corridors
- Additional Survey Corridors
- Removed Survey Corridors
- Connector Corridors
- Lease Area
- Wetland
- Bridge
- Culvert
- Wetland Data Plots
- Upland Data Plots

Locator Map



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Miles

Section 2

Section 3

L
B2
N2
C2
G2
I
E2
Q2
J
G
H
I2
J2
E
D
M2
M1
Wetland M
B2
B1
Wetland B

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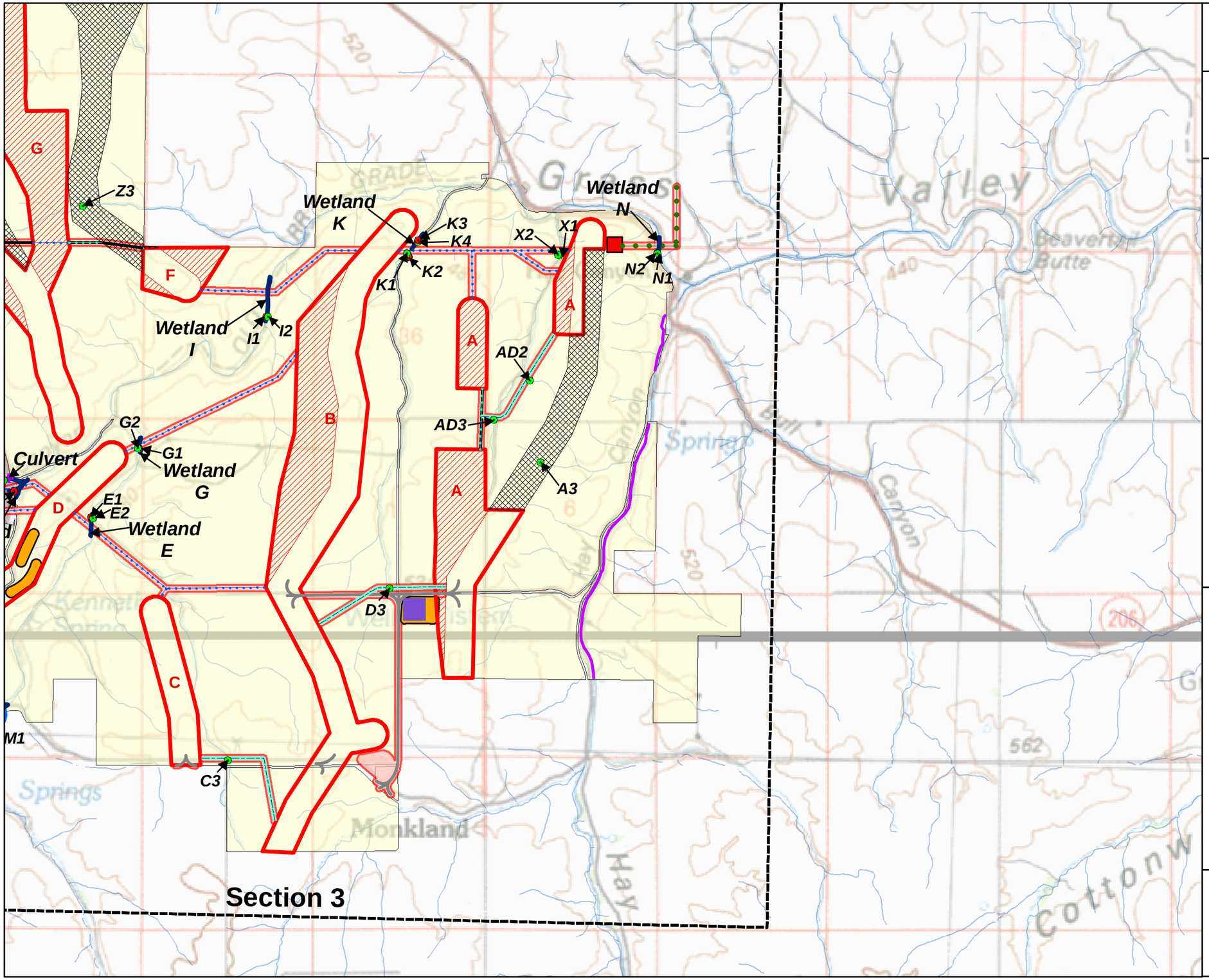
Golden Hills Wind Project
Addendum to Exhibit J

Figure J-3 (Sheet 5 of 5)

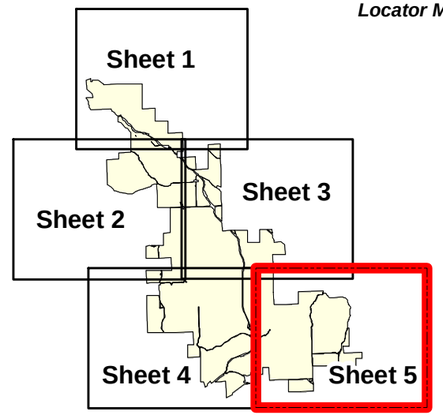
Data Plots and
Wetland Delineation



Legend

- Transmission Line
- Underground Collector
- Crane Path and Underground Collector
- Crane Path
- New Road
- Existing Road Improvement
- Waters of the U.S./State
- Bridge area
- Laydown
- O&M Building
- Substation
- REVISED Survey Corridors
- Additional Survey Corridors
- Removed Survey Corridors
- Connector Corridors
- Lease Area
- Wetland
- Bridge
- Culvert
- Wetland Data Plots
- Upland Data Plots

Locator Map



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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 1 of 13)
National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

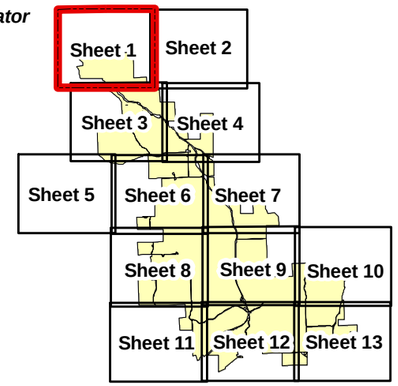
Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
PEM1Fh	Palustrine, emergent, persistent, semipermanently flooded, diked/impounded
PEMC	Palustrine, emergent, seasonally flooded
PFOA	Palustrine, forested, broad-leaved deciduous, seasonally flooded
PFO1C	Palustring, forested, temporarily flooded
POWFh	Palustrine, open water, semipermanently flooded, diked/impounded
POWHh	Palustrine, open water, Permanently flooded, diked/impounded
PUSAh	Palustrine, unconsolidated shore, temporarily flooded, diked/impounded
R4SBC	Riverine, intermittent, streambed, seasonally flooded
R4SBF	Riverine, intermittent, streambed, semipermanently flooded

N

0 0.5 Miles

Map Locator



Data Sources:

National Wetlands Inventories:
- Biggs Junction, OR-WA 1981
- Erskine, OR 1990
- Esau Canyon, OR 1990
- Harmony, OR 1990
- Klondike, OR 1981
- Locust Grove, OR 1981
- McDonald, OR 1981
- Moro, OR 1990
- Quinton, OR-WA 1981
- Rufus, OR-WA 1981
- Wasco, OR 1981

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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 2 of 13)
National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

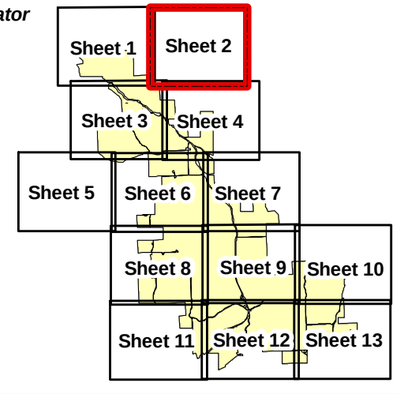
Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
PEM1Fh	Palustrine, emergent, persistent, semipermanently flooded, diked/impounded
PEMC	Palustrine, emergent, seasonally flooded
PFOA	Palustrine, forested, broad-leaved deciduous, seasonally flooded
PFO1C	Palustring, forested, temporarily flooded
POWFh	Palustrine, open water, semipermanently flooded, diked/impounded
POWHh	Palustrine, open water, Permanently flooded, diked/impounded
PUSAh	Palustrine, unconsolidated shore, temporarily flooded, diked/impounded
R4SBC	Riverine, intermittent, streambed, seasonally flooded
R4SBF	Riverine, intermittent, streambed, semipermanently flooded

N

0 0.5
Miles

Map Locator



Data Sources:

National Wetlands Inventories:
- Biggs Junction, OR-WA 1981
- Erskine, OR 1990
- Esau Canyon, OR 1990
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- Locust Grove, OR 1981
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- Moro, OR 1990
- Quinton, OR-WA 1981
- Rufus, OR-WA 1981
- Wasco, OR 1981

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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 3 of 13)
National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
PEM1Fh	Palustrine, emergent, persistent, semipermanently flooded, diked/impounded
PEMC	Palustrine, emergent, seasonally flooded
PFOA	Palustrine, forested, broad-leaved deciduous, seasonally flooded
PFO1C	Palustring, forested, temporarily flooded
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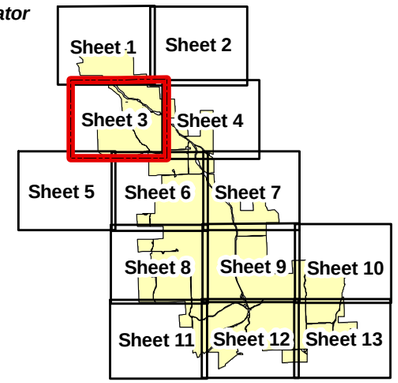
N

0 0.5
Miles

Map Locator



Data Sources:

National Wetlands Inventories:
- Biggs Junction, OR-WA 1981
- Erskine, OR 1990
- Esau Canyon, OR 1990
- Harmony, OR 1990
- Klondike, OR 1981
- Locust Grove, OR 1981
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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 4 of 13)
National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
PEM1Fh	Palustrine, emergent, persistent, semipermanently flooded, diked/impounded
PEMC	Palustrine, emergent, seasonally flooded
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R4SBC	Riverine, intermittent, streambed, seasonally flooded
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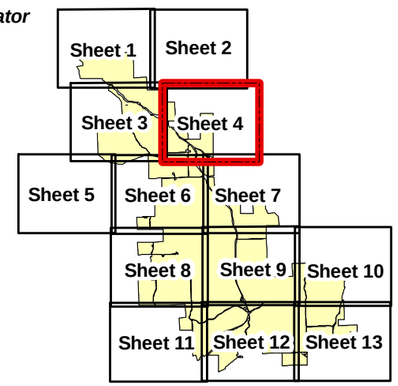
N

0 0.5 Miles

Map Locator



Data Sources:

National Wetlands Inventories:
- Biggs Junction, OR-WA 1981
- Erskine, OR 1990
- Esau Canyon, OR 1990
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- Klondike, OR 1981
- Locust Grove, OR 1981
- McDonald, OR 1981
- Moro, OR 1990
- Quinton, OR-WA 1981
- Rufus, OR-WA 1981
- Wasco, OR 1981

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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 5 of 13)
National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
PEM1Fh	Palustrine, emergent, persistent, semipermanently flooded, diked/impounded
PEMC	Palustrine, emergent, seasonally flooded
PFOA	Palustrine, forested, broad-leaved deciduous, seasonally flooded
PFO1C	Palustring, forested, temporarily flooded
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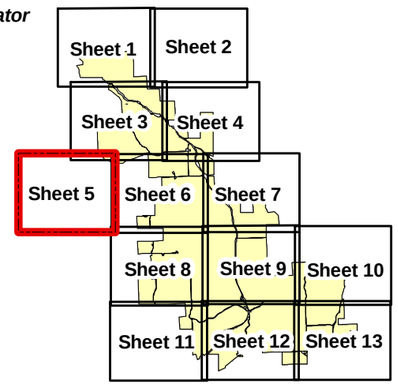
R4SBC	Riverine, intermittent, streambed, seasonally flooded
R4SBF	Riverine, intermittent, streambed, semipermanently flooded

N

0 0.5 Miles

Map Locator



Data Sources:

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- Biggs Junction, OR-WA 1981
- Erskine, OR 1990
- Esau Canyon, OR 1990
- Harmony, OR 1990
- Klondike, OR 1981
- Locust Grove, OR 1981
- McDonald, OR 1981
- Moro, OR 1990
- Quinton, OR-WA 1981
- Rufus, OR-WA 1981
- Wasco, OR 1981

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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 6 of 13)
National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
PEM1Fh	Palustrine, emergent, persistent, semipermanently flooded, diked/impounded
PEMC	Palustrine, emergent, seasonally flooded
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POWHh	Palustrine, open water, Permanently flooded, diked/impounded
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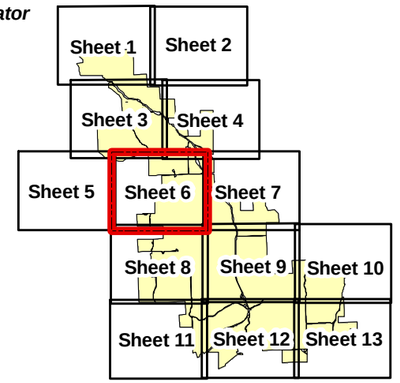
R4SBC	Riverine, intermittent, streambed, seasonally flooded
R4SBF	Riverine, intermittent, streambed, semipermanently flooded

N

0 0.5
Miles

Map Locator



Data Sources:

National Wetlands Inventories:
- Biggs Junction, OR-WA 1981
- Erskine, OR 1990
- Esau Canyon, OR 1990
- Harmony, OR 1990
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- Locust Grove, OR 1981
- McDonald, OR 1981
- Moro, OR 1990
- Quinton, OR-WA 1981
- Rufus, OR-WA 1981
- Wasco, OR 1981

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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 7 of 13)

National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
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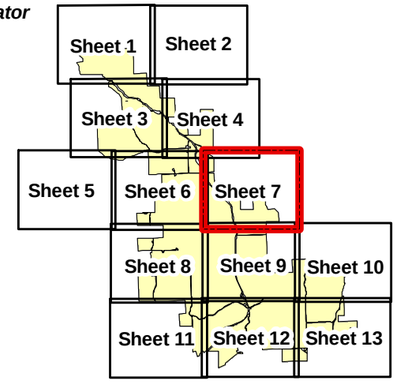
R4SBC	Riverine, intermittent, streambed, seasonally flooded
R4SBF	Riverine, intermittent, streambed, semipermanently flooded

N

0 0.5 Miles

Map Locator



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National Wetlands Inventories:
- Biggs Junction, OR-WA 1981
- Erskine, OR 1990
- Esau Canyon, OR 1990
- Harmony, OR 1990
- Klondike, OR 1981
- Locust Grove, OR 1981
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- Quinton, OR-WA 1981
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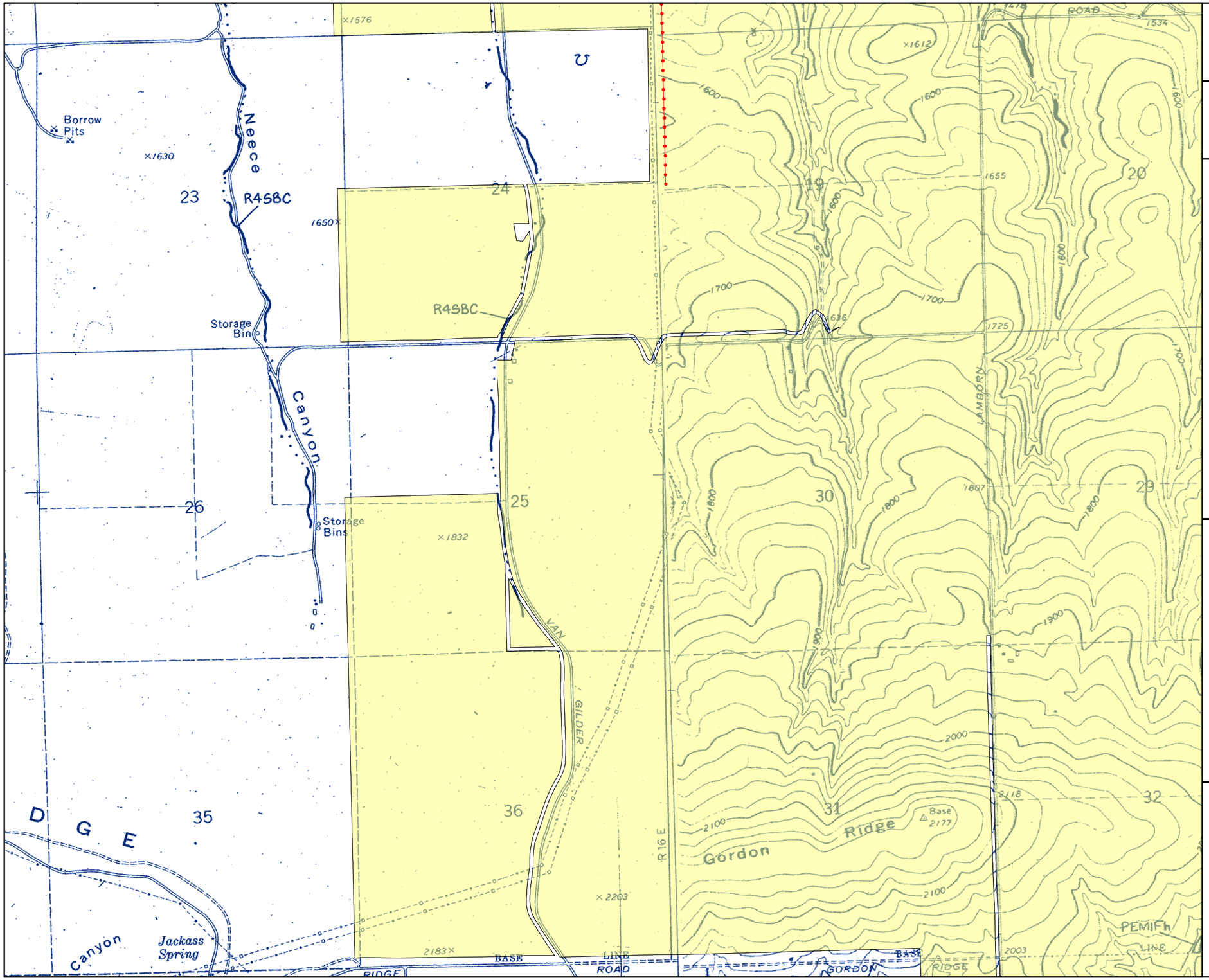
Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 8 of 13)
National Wetlands Inventory



Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
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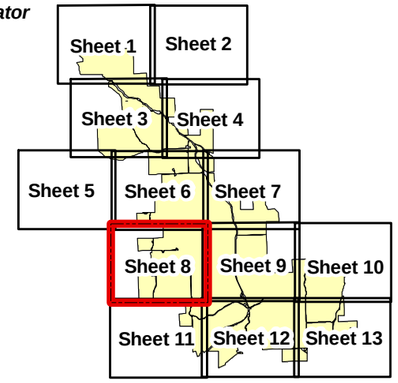
R4SBF	Riverine, intermittent, streambed, semipermanently flooded

N

0 0.5
Miles

Map Locator



Data Sources:

National Wetlands Inventories:
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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 9 of 13)
National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
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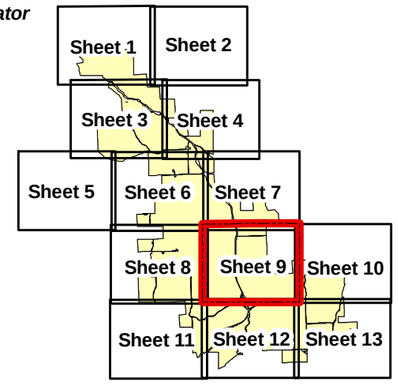
R4SBC	Riverine, intermittent, streambed, seasonally flooded
R4SBF	Riverine, intermittent, streambed, semipermanently flooded

N

0 0.5 Miles

Map Locator



Data Sources:

National Wetlands Inventories:
- Biggs Junction, OR-WA 1981
- Erskine, OR 1990
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- Harmony, OR 1990
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- Locust Grove, OR 1981
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- Moro, OR 1990
- Quinton, OR-WA 1981
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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 10 of 13)

National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
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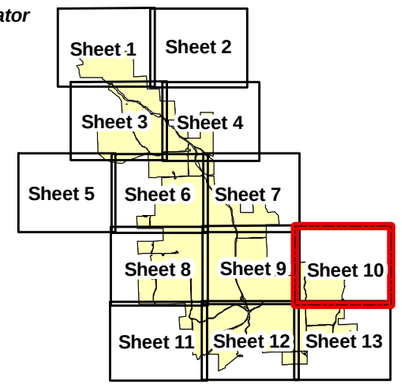
N

0 0.5

Miles

Map Locator



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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 11 of 13)
National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
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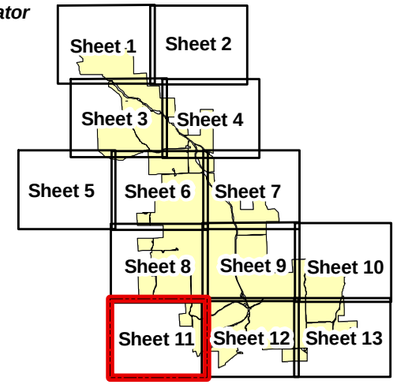
N

0 0.5

Miles

Map Locator



Data Sources:

National Wetlands Inventories:

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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 12 of 13)
National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
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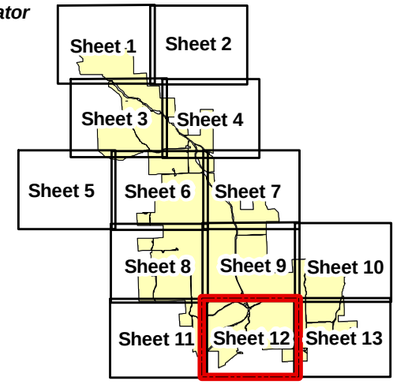
N

0 0.5
Miles

Map Locator



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- Quinton, OR-WA 1981
- Rufus, OR-WA 1981
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Golden Hills Wind Project
Addendum to Exhibit J

Figure J-4 (Sheet 13 of 13)

National Wetlands Inventory

Legend

- Approximate BPA Substation Locations
- Transmission Line
- Lease Area

Types of Wetlands

PEM1A	Palustrine, emergent, persistent, temporarily flooded
PEM1C	Palustrine, emergent, persistent, seasonally flooded
PEM1Fh	Palustrine, emergent, persistent, semipermanently flooded, diked/impounded
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PFOA	Palustrine, forested, broad-leaved deciduous, seasonally flooded
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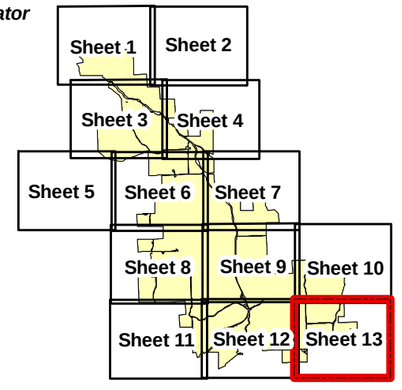
N

0 0.5

Miles

Map Locator



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- Harmony, OR 1990
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- Locust Grove, OR 1981
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Golden Hills Wind Project
Addendum to Exhibit J

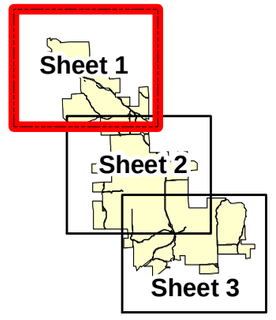
Figure J-5 (Sheet 1 of 3)
Soil Survey

Legend

Lease Area

Soil Survey

1B Anderly silt loam, 1 to 7 percent slopes
1C Anderly silt loam, 7 to 15 percent slopes
2D Anderly silt loam, 15 to 35 percent north slopes
3D Anderly silt loam, 15 to 35 percent south slopes
5D Anders very fine sandy loam, 15 to 35 percent slopes
11A Endersby fine sandy loam, 0 to 3 percent slopes
12A Endersby-Hermiston complex, 0 to 3 percent slopes
14C Kuhl very stony very fine sandy loam, 3 to 20 percent slopes
15D Kuhl-Rock outcrop complex, 20 to 40 percent north slopes
16D Lickskillet very stony loam, 7 to 40 percent south slopes
17C Lickskillet-Bakeoven complex, 2 to 20 percent slopes
18E Lickskillet-Rock outcrop complex, 40 to 70 percent south slopes
21E Nansene-Rock outcrop complex, 35 to 70 percent north slopes
25A Riverwash
27E Rock outcrop-Rubble land-Lickskillet complex, 50 to 80 percent south slopes
31B Walla Walla silt loam, 1 to 7 percent slopes
31C Walla Walla silt loam, 7 to 15 percent slopes
32D Walla Walla silt loam, 15 to 35 percent north slopes
33D Walla Walla silt loam, 15 to 35 percent south slopes
34B Wato very fine sandy loam, 3 to 7 percent slopes
34C Wato very fine sandy loam, 7 to 15 percent slopes
35D Wato very fine sandy loam, 15 to 35 percent north slopes



Data Sources:

30x60 USGS Quadrangles:
Condon, OR 1981
Goldendale, OR-WA 1980

Natural Resources Conservation Service
(Soil Survey Sherman County)

N

0 0.25 0.5 0.75 1
Miles

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Golden Hills Wind Project
Addendum to Exhibit J

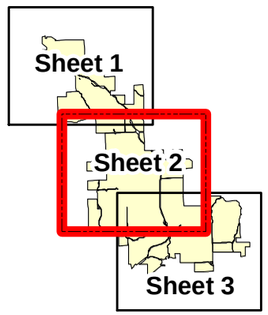
Figure J-5 (Sheet 2 of 3)
Soil Survey

Legend

Lease Area

Soil Survey

1B Anderly silt loam, 1 to 7 percent slopes
1C Anderly silt loam, 7 to 15 percent slopes
2D Anderly silt loam, 15 to 35 percent north slopes
3D Anderly silt loam, 15 to 35 percent south slopes
5D Anders very fine sandy loam, 15 to 35 percent slopes
11A Endersby fine sandy loam, 0 to 3 percent slopes
12A Endersby-Hermiston complex, 0 to 3 percent slopes
14C Kuhl very stony very fine sandy loam, 3 to 20 percent slopes
15D Kuhl-Rock outcrop complex, 20 to 40 percent north slopes
16D Lickskillet very stony loam, 7 to 40 percent south slopes
17C Lickskillet-Bakeoven complex, 2 to 20 percent slopes
18E Lickskillet-Rock outcrop complex, 40 to 70 percent south slopes
21E Nansene-Rock outcrop complex, 35 to 70 percent north slopes
25A Riverwash
27E Rock outcrop-Rubble land-Lickskillet complex, 50 to 80 percent south slopes
31B Walla Walla silt loam, 1 to 7 percent slopes
31C Walla Walla silt loam, 7 to 15 percent slopes
32D Walla Walla silt loam, 15 to 35 percent north slopes
33D Walla Walla silt loam, 15 to 35 percent south slopes
34B Wato very fine sandy loam, 3 to 7 percent slopes
34C Wato very fine sandy loam, 7 to 15 percent slopes
35D Wato very fine sandy loam, 15 to 35 percent north slopes



Data Sources:

30x60 USGS Quadrangles:
Condon, OR 1981
Goldendale, OR-WA 1980

Natural Resources Conservation Service
(Soil Survey Sherman County)

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Golden Hills Wind Project
Addendum to Exhibit J

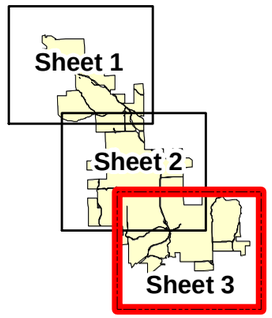
Figure J-5 (Sheet 3 of 3)
Soil Survey

Legend

Lease Area

Soil Survey

1B Anderly silt loam, 1 to 7 percent slopes
1C Anderly silt loam, 7 to 15 percent slopes
2D Anderly silt loam, 15 to 35 percent north slopes
3D Anderly silt loam, 15 to 35 percent south slopes
5D Anders very fine sandy loam, 15 to 35 percent slopes
11A Endersby fine sandy loam, 0 to 3 percent slopes
12A Endersby-Hermiston complex, 0 to 3 percent slopes
14C Kuhl very stony very fine sandy loam, 3 to 20 percent slopes
15D Kuhl-Rock outcrop complex, 20 to 40 percent north slopes
16D Lickskillet very stony loam, 7 to 40 percent south slopes
17C Lickskillet-Bakeoven complex, 2 to 20 percent slopes
18E Lickskillet-Rock outcrop complex, 40 to 70 percent south slopes
21E Nansene-Rock outcrop complex, 35 to 70 percent north slopes
25A Riverwash
27E Rock outcrop-Rubble land-Lickskillet complex, 50 to 80 percent south slopes
31B Walla Walla silt loam, 1 to 7 percent slopes
31C Walla Walla silt loam, 7 to 15 percent slopes
32D Walla Walla silt loam, 15 to 35 percent north slopes
33D Walla Walla silt loam, 15 to 35 percent south slopes
34B Wato very fine sandy loam, 3 to 7 percent slopes
34C Wato very fine sandy loam, 7 to 15 percent slopes
35D Wato very fine sandy loam, 15 to 35 percent north slopes



Data Sources:

30x60 USGS Quadrangles:
Condon, OR 1981
Goldendale, OR-WA 1980

Natural Resources Conservation Service
(Soil Survey Sherman County)

N

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Miles

Map Document: (P:\B\BPOC00000005\0600INFO\GS\arcmap\Addendum\Fig_J-5_Soils_Addend1_031808.mxd)
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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Golden Hills City/County: Sherman Sampling Date: 4/3/08

Applicant/Owner: BP State: OR Sampling Point: 1

Investigator(s): EJRO, PRR Section, Township, Range:

Landform (hillslope, terrace, etc.): draw Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR): B Lat: Long: Datum:

Soil Map Unit Name: NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? N/o Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Agropyron intermedium	75	✓	UPL
2. Lactuca serriola	20	✓	FACU
3. Salsola kali	5		UPL
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/4	100	none				Fine Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Located in plowed through draw. Mapped as drainage on USGS. No Channel present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Golden Hills City/County: Sherman Sampling Date: 4/3/08

Applicant/Owner: State: OR Sampling Point: 2

Investigator(s): ESRO, PRR Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope/draw Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): B Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____ No ✓	
Wetland Hydrology Present?	Yes ____ No ✓	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Agropyron spicatum	15	✓	UPL
2. Bromus sp.	15	✓	UPL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover: 30			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Plowed through w/some vegetation recolonizing.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/4		none				Fine Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydro indicators. Plowed through draw. No channel.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Golden Hills City/County: Sherman Sampling Date: 4/3/08

Applicant/Owner: BP State: OR Sampling Point: 3

Investigator(s): EJRO, PRR Section, Township, Range:

Landform (hillslope, terrace, etc.): draw Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): B Lat: Long: Datum:

Soil Map Unit Name: NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Agropyron intermedium	60	✓	UPL
2. Lactuca serriola	30	✓	FACU
3. Bromus tectorum	20		UPL
4.			
5.			
6.			
7.			
8.			
Total Cover:	110		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/3		none				Fine Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Located in drawer. No hydro indicators. No channel present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Golden Hills City/County: Sherman Sampling Date: 4/4/08

Applicant/Owner: BP State: OR Sampling Point: 4

Investigator(s): ESRO, PRR Section, Township, Range:

Landform (hillslope, terrace, etc.): draw Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): B Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✓	**Is the Sampled Area within a Wetland?** Yes ____ **No** ✓
Hydric Soil Present?	Yes ____ No ✓	
Wetland Hydrology Present?	Yes ____ No ✓	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Elytrigia repens	20		FAC-
2. Bromus tectorum	75	✓	UPL
3. Lactuca serriola	10		FACU
4.			
5.			
6.			
7.			
8.			
Total Cover:	105		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ **No** ✓

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100	none				Fine sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Located in draw, No hydro indicators. No channel.

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: January 10, 2008
TO: Dana Siegfried
FROM: Alex Dupey
SUBJECT: **RAI-Land Use (Exhibit K)**
PROJECT: Goldern Hills ASC
PROJECT NO: BPOC0000-0005
COPIES:

The following narrative provides response to the Oregon Energy Facility Siting Council's completeness review for the Golden Hills Application for Site Certificate, Exhibit K.

Exhibit K

The application at Exhibit K page K-5 says that it is "assumed" that turbines will be placed on the plateaus rather than in the steeper valleys where the Sherman County Natural Hazard overlay combining zone is located. Therefore, it is assumed that the Combining District does not apply. I looked at the map in Exhibit K and it looks like turbine corridors will avoid the combining overlay, but underground collector lines will cross it.

I realize that collector lines are not as vulnerable in a seismic event and would not pose a danger. However, for a complete land use analysis, the application has to address all the parts of the project in all zones. GHWF will have to either commit to completely avoiding the natural hazard overlay zone (even for collector lines) or address the requirements of that zone.

Response: Portions of the underground collector system and a short section of the 230kV transmission line will cross the Natural Hazards (NH) Combine Zone. Responses to Section 3.7 of the Sherman County Zoning Ordinance that discuss the relevant NH criteria are included as Attachment 1. Also included is a revised map (Figure K-1) that better identifies the project components that will be located within the NH Zone.

My second question concerns the 230 and 500 kV lines. In land use we make a distinction between lines that are along public road right of way and lines that are not. They're both permitted, but the analysis is different. It's very hard to tell from Figure C-2 and Figure K-1 which parts of the transmission lines follow roads, which ones follow existing transmission right of way, and which would not be in either road or existing transmission right of way. If you could clarify, that would help a great deal.

Response: Both the 230kV and 500 kV transmission lines will be located on private land in a 150-foot easement, not in public right of way. While portions of the project 230kV (to the Klondike substation) transmission line will be located adjacent to the existing public right-of-way for Sanden Road, none of the project facilities will be located within Sanden Road's public right-of-way.

The 500kV transmission line located at the northern end of the project will also be constructed on private land within approximately 200-foot easements secured from private landowners. Approximately 6 miles of this

transmission line will be parallel to existing BPA 500 kV transmission line right-of-way, but will not be located within the BPA right-of-way.

Copies:
Attachments/Enclosures: Attachment 1: Response to the NH Zoning criteria; Revised Figure K-1
Initials: WAD
File Name: P:\B\BPOC00000005\0600INFO\0670Reports\0672 - Application for Site Certificate\0672 - Exhibit K\RAI\RAI Responses 1.10.07.doc
Project Number: BPOC0000-0005

SCZO § *3.7* NATURAL *HAZARDS COMBINING ZONE (NH)*

In any Zone that is combined with the (NH) Combining Zone, the requirements and standards of this Section shall apply in addition to those set forth in the primary zone, provided that if a conflict occurs, the more restrictive provisions shall govern.

Response: Portions of the underground collection system and the southern most portion of the 230kV transmission line will be located within the NH Zone (see Figure K-1) and are addressed under the NH zone criteria, below.

1. *Purpose - The purpose of the (NH) Combining Zone is to promote and protect the public health, safety and general welfare and to minimize potential losses by providing guidelines for development in hazard areas. Development limitations are applicable to developments in areas of surface water accumulations and high groundwater, unstable or fragile soils, geological hazards, and steep slopes, generally those of 30 percent or greater.*

Response: As described below, the project components within the NH zone comply with the purpose this zone as well as the underlying F-1 land use designation.

2. *Uses Permitted Outright - In a Zone with which the (NH) Zone is combined, the following uses are the only uses permitted outright, and these uses are permitted as such if so permitted by the underlying primary zone.*

   (a) *Agricultural uses conducted without locating a structure, except for boundary fences, and, so restricted as to prevent destruction of vegetation sufficient to cause or increase erosion hazards, and so restricted as to prevent the contamination of surface or ground waters.*

   (b) *Industrial or commercial uses that do not require a structure other than surfacing at ground level such as a loading and/or parking area, or that requires only temporary structures that will not necessitate ground excavation for placement or impede surface water flows.*

   (c) *Recreational uses that require no permanent structures, alteration of natural geology, or vegetation removal without immediate replacement.*

   (d) *Portions of a residential use that do not contain buildings such as a lawn, garden, parking or play area, or a related use thereof that does not require excavation or alteration of the natural geology, or vegetation removal without immediate replacement.*

Response: All project components are permitted as a conditional use within the F-1 zone, including the project components that will be located within the NH Zone. Project components (collector system and transmission line) within the NH zone are not permitted outright because both components will require excavation, and in the case of the 230 kV transmission line, will require between 2 and 5 100 to 110 foot poles to be located within the NH zone. A pole is considered a structure under the SCZO definition, which identifies a structure as an "edifice or building of any kind...which requires location on the ground..."

3. *Conditional Uses - In any Zone with which the (NH) Zone is combined, all uses permitted by the primary Zone, except those set forth in Subsection (2) above, shall be permitted only as Conditional Uses and subject to the provisions of this Zone and the primary Zone. Said permits shall be processed in accordance with the provisions set forth for a Conditional Use, or as set for by this Ordinance.*

Response: All project components are permitted as a conditional use within the F-1 zone, including the project components that will be located within the NH Zone. The project complies the SCZO conditional use standards and supplemental development standards, all of which are described in Section K.4 and K.5 of Exhibit K.

4. *Permit for Use or Development in a (NH) Zone - No person shall construct, reconstruct, or install a use or development unless a permit therefore has been received, except for those uses permitted as Outright by Subsection (2) of this Section. Except for the improvement of an existing structure which is less than substantial as determined by a Certified Building Official or the County upon appeal, no permit shall be issued unless the use or development will be determined to be reasonably safe from the applicable hazard, and otherwise in compliance with the provisions of this Section, the Zone, this Ordinance and other applicable regulations.*

Response: No construction will occur until the applicant is given written notice of approval of the project application.

5. *Application Requirements for a Use in a (NH) Zone - An application for a use or development in a Zone with which the (NH) Zone is combined, shall be accompanied by the following:*

    (a) *Site Investigation Report: An application for a use or development in a (NH) Zone requires a site investigation report for the subject-affected area. The site investigation report shall provide information on the site of the proposed use or development and*

surrounding and adjacent lands that are most likely to be affected thereby. Unless the County determines that specific items are not required, the report shall include the information described in this Subsection, together with appropriate identification of information sources and the date of the information. The approved site investigation report may be required to be referenced in the deed and other documents of sale, and may be required to be recorded with the deed of record.

Response: The Golden Hills Application for Site Certificate (ASC) evaluates all land within the project lease area and vicinity and provides the necessary information to comply with the standards set forth in the NH Zone. The lease area is shown in Figure K-1 of the ASC. Exhibit H of the ASC provides analysis of the geologic conditions of the project lease area, including the area within the NH Zone.

Exhibit H of the ASC was completed using the following tools for analysis:

1. A detailed office study and geologic field reconnaissance to preliminarily evaluate seismic and non-seismic related hazards.
2. A review of publications including topographic maps, aerial photos, geologic maps, professional publications, and soil surveys to identify potential subsurface soil and bedrock conditions, bedrock depth and lithology, and structural attitude of faults within the Project.
3. A field reconnaissance along the proposed wind turbine corridors, new access road alignments, power collection system corridors, substations, overhead transmission lines, temporary laydown areas, and existing state and county roads designated for improvements. The field reconnaissance concentrated on identifying geologic hazards, particularly in areas of concern identified during the review of geologic literature.
4. A seismic hazard analysis to establish earthquake ground motion parameters suitable for use in design of the proposed facilities. Amplification factors at the Project were based on a review of existing geologic information and information collected during the site reconnaissance.

Analysis Results

The work conducted and described in Exhibit H of the ASC suggests that project transmission lines do not cross (nor are near) areas that show gross indicators of landslide (recent, historic, and ancient) activity or marginal stability.

The underground collectors for the Project within the NH zone will be placed underground. Native soil and bedrock stability concerns at cuts, fills and culvert crossings will be addressed during future, site-specific

geotechnical studies planned during the design phase of the Project. This future work will include development of design and construction recommendations that minimize the potential for destabilizing marginally stable slopes and minimize the potential for stream erosion at stream crossings.

(b) Background Data in Report. At a minimum, the Site Investigation Report shall contain the following background information:

1) A general analysis of the affected site and general area's topography and geology, including faults, folds, geologic and engineering geologic units, and any soils, rock and structural details important to the engineering or geological interpretations and the their relative activity.

Response: Topographic and geologic conditions/hazards within the Project were evaluated by reviewing available reference materials (including publications and State logs of water wells), reviewing topographic and geologic maps, and aerial photos, and conducting a field reconnaissance of the proposed project area. Prior to construction, explorations, testing, and engineering analysis will be conducted for final design purposes.

Topography

The open rolling hills and steeper narrow canyons within the Project range in surface elevation from about 1,100 feet on the northern edge to about 1,900 feet on the rolling hills near the southern edge of the project area. Regionally, the ground surface generally slopes down the north.

Much of the project area ground surface gradient is very flat with a typical range of about 1 to 5 percent in the open rolling hills and near the crest of ridges. There are areas where the slopes approach 10 percent. The gradient with the side slopes of the rolling hills and narrower ridges is generally controlled by near-surface geology (i.e., loess or basalt) and typically ranges from 5 to 10 percent, with some areas approaching 20 to 25 percent and isolated steeper areas (especially where basalt bedrock is exposed at the ground surface).

Geologic Features

All of Sherman County is located within the Deschutes-Columbia River Plateau in north-central Oregon. The project area is located in the Columbia Plateau physiographic province. The province is predominantly a volcanic plateau covering over 63,000 square miles in Oregon, Washington and Idaho. Mountains surround the plateau on all sides; the Okanogan Highlands are located to the

north, the Cascade Range to the west, and the Blue Mountains in Oregon to the south and east. In Oregon, the province surface gently descends northerly towards the Columbia River.

The bedrock that underlies much of the region began erupting approximately 24 million years ago as immense outpourings of basalt. During this time, the voluminous flows of the Columbia River Basalt Group erupted from volcanic vents located in central and northeast Oregon, southeast Washington and Idaho. These eruptions created a massive "flood basalt" province.

The Grande Ronde Basalt and Frenchman Springs and Priest Rapids members, of the Wanapum Basalt, are all part of the Columbia River Basalt Group (CRBG) that comprises the volcanic bedrock in most of the area. The Grande Ronde Basalt is the oldest of the three basalt types and also has the most extensive surface exposure in this study area. The Grande Ronde Basalt consists of fine-grained basalt with a total thickness up to several thousand feet. Quaternary loess (i.e., wind blown silt) deposits cover most of the bedrock in the Project. In general, basalt bedrock is only exposed at the ground surface in valley walls, road cuts, and rock pits.

Near the end of the last major Ice Age about 15,000 years ago, large lakes formed behind massive ice dams in western Montana. When these dams repeatedly failed (on the order of about 40 times), the torrential "Missoula Floods" repeatedly poured massive amounts of water and debris down the Columbia Plateau. These floods continued for about 2,000 years.

Flood elevations likely reached as high as about 1,100 feet above mean sea level (amsl) in the vicinity of the Project. Where side canyons or tributaries enter the Columbia River, the flood waters flowed back into them. Just north of the Project, the lower elevations of the canyons show topographic evidence suggesting scouring by the ebb and flood of the "Missoula Floods".

The massive outpourings scoured the surface of the Columbia Plateau bedrock and also deposited silt, sand, gravel, and cobbles/boulders. After the Missoula Floods, stream and some wind-related depositional and erosive processes continued to dominate the geology of the Columbia Plateau. Alluvium, alluvial fans, and landslides have formed in incised valleys while deposits of wind blown sand and silt (i.e., loess) have formed on top of the basalt bedrock.

Based on the results of this study, the loess covers the underlying basalt bedrock throughout much of the project area. Topographic maps, geologic maps, logs of water wells, and the site reconnaissance indicates that the loess deposit ranges up to about

40 feet thick (averaging about 15 feet). This deposit overlies the basalt bedrock and appears to thin or not exist within the steeper areas along the sides of relatively narrow ridges and within drainageways found throughout the project area (i.e., where basalt bedrock is exposed).

Logs of water wells, native exposures of basalt bedrock, and basalt quarry exposures indicate that the basalt generally is variably fractured, is fresh to slightly weathered, possesses very close to wide joint spacing, and has a variable hardness (generally ranging from medium hard to hard). Where observed, the contacts between layers of basalt show limited or no signs of a distinct weathered soil horizon.

Soils

A relatively thin veneer of soil exists throughout most of the project study area. The soil principally consists of silty loam formed from weathering of loess (i.e., wind-blown silt and fine sand). Where the loess deposit thins, there are variable amounts of weathered rock fragments derived from basalt bedrock that underlies the loess. Where basalt bedrock is exposed at the ground surface, the soil consists of very gravelly/cobbly loamy sand with boulders.

2) *Location and approximate depths of seasonal surface water accumulations and groundwater tables, and location and direction of all watercourses, including intermittent flows.*

Response: The site topography generally consists of rolling hills, with shallow bedrock depths and a deep groundwater table. Exhibit J (Wetlands) identifies all wetlands, streams and riparian areas in the vicinity of the project. These include Locust Grove Canyon, China Hollow, Mud Hollow, Spanish Hollow, and Grass Valley Canyon. These major drainage features are all tributaries of the Columbia River and considered jurisdictional waters. Of these only Grass Valley Canyon is within the NH Zone. The Grass Valley Canyon heads eastward and continues out of the wetland analysis area to join the John Day River north to the Columbia River.

During June site visits, water was observed in and Grass Valley Canyon. Depth of water in the Grass Valley drainage during the site visit was approximately _____inches.

Comment [WAD1]: Who did the wetlands work? Maybe they know this?

3) *A history of soil and water related problems on the site and adjacent lands, which may be derived from discussions with local residents and officials and the study of old photographs, reports and newspaper files.*

Response: An analysis of the entire project site, including areas outside of the NH zone, was completed as part of Golden Hills ASC. Exhibit H of the ASC indicates that the Project components have been sited to avoid potential geologic hazard areas that could become destabilized by a seismic event. In addition, rock is present at shallow depths, and the groundwater table is deep. Considering these site conditions, the potential for earthquake-induced landslides, lateral spreading, liquefaction and settlement/subsidence at the site are low. Moreover, Exhibit H also concludes that non-seismic geologic hazards, including slope instability and landslides, are not geologic hazards that will impact the project due to site conditions.

A detailed design geotechnical investigation will be conducted prior to the start of construction for the entire project, including those components within the NH Zone. This design study will include exploratory test drilling at key locations where site improvements are proposed. Where needed to enhance understanding of subsurface soil/rock conditions in some areas and provide details on bulk shear wave velocity and other properties, down-hole and surface geophysical studies will be conducted. As needed, field resistivity and other non-destructive geophysical testing will be conducted.

4) *The extent of the surface soil formation and its relationship to the vegetation of the site, the activity of the landform, and the locations on the site and surrounding areas.*

Response: Exhibits I and J of the ASC describes all soils with the project vicinity and identify general use categories (i.e. wheat/barley production, grazing etc.) recommended for those soils types. Additionally Exhibit H provides a description of soils. Vegetation in the vicinity of Grass Valley is generally intermediate wheatgrass. Data points used to determine the plant communities and locations (see Exhibit J, attachment J-1, Data Points N1 and N2) identified reed canary grass, cattails, and intermediate wheatgrass in areas along the creek in Grass Valley and intermediate wheatgrass on upland areas.

5) *The following ground photographs of the site and surrounding areas with information showing the scale and date of photographs and their relationship to the topographic map and profiles:*

   A. *A view of the general area.*
   B. *The site of the proposed development.*
   C. *Any features which are important to the interpretation of the hazard potential of the site,*

including all sites of erosion, surface or groundwater accumulations, or accretion.

Response: Ground photos are not currently available for the project, although the Golden Hills ASC and supporting documentation provides extensive information for the entire project site, including areas within the NH Zone. Project area maps using USGS information are included in Exhibit H of the ASC. Furthermore, a detailed design geotechnical investigation will be conducted prior to the start of construction for the entire project, including those components within the NH Zone. This study will include a detailed study of all project components, including those within the NH Zone.

(c) *Topography Map. A topography base map at a scale of not more than 1:100 with a contour interval of 2 feet shall be prepared identifying the following features and accompanied by references to the source(s) and date(s) of information used.*

1) *Position of lot lines.*
2) *Boundaries of the property.*
3) *Each geological feature classification type.*
4) *Areas of open ground and the boundaries and species identification of major plant communities.*
5) *Any springs, streams, marshy areas, standing bodies of water, intermittent waterways, drainage ways, and high groundwater areas with highest annual levels.*
6) *Cut terraces, erosion scarps, and areas exhibiting significant surface erosion due to improper drainage and runoff concentration.*
7) *Geological information, including lithologic and structural details important to engineering and geologic interpretations.*

Response: The Golden Hills ASC provides much of this information. Exhibit C identifies lot lines and the project's lease area; Exhibit H provides detailed site and geology maps, and Exhibit J identifies water bodies. Furthermore, a detailed design geotechnical investigation will be conducted prior to the start of construction for the entire project, including those components within the NH Zone. This study will include a detailed study of all project components, including those within the NH Zone.

(d) *Subsurface Analysis. If upon initial investigation if it appears there are critical areas where the establishment of geologic conditions at specific depths is required, a subsurface analysis obtained by drilling holes, well logs, and other geophysical techniques shall be conducted, or caused to be conducted by a*

qualified expert, by the person responsible for the site, and investigation report to include the following data as appropriate:

1) The lithology and compaction of all subsurface horizons to bedrock.

2) The depth, width, slope and bearing of all horizons containing significant amounts of silt and clay and any other subsurface layers which could reduce the infiltration of surface waters.

Response: A detailed design geotechnical investigation will be conducted prior to the start of construction for the entire project, including those components within the NH Zone. This design study will include exploratory test drilling at key locations where site improvements are proposed. Where needed to enhance understanding of subsurface soil/rock conditions in some areas and provide details on bulk shear wave velocity and other properties, down-hole and surface geophysical studies will be conducted. As needed, field resistivity and other non-destructive geophysical testing will be conducted to evaluate bulk properties.

Soil and rock samples obtained during explorations will be utilized to evaluate soil and rock characteristics in a laboratory. Such testing will include an array of tests including some or all of the following: index tests to identify general characteristics, shear and compressive tests, soil modulus tests for pavement design, thermal conductivity, and a series of tests to evaluate corrosion potential.

Geotechnical engineering analysis of the field and laboratory data will be conducted. Design recommendations will be prepared to address a myriad of design and construction considerations including geotechnical aspects related to foundations, site grading, utilities, roadways, and improvements to existing infrastructure (e.g., roads, culverts, bridges).

(e) Development Proposal. The site investigation report shall include the following information on the proposed development as applicable:

1) Plans and profiles showing the position and height of each structure, paved areas, and areas where cut and fill is required for construction.

2) The percent and location of the surface of the site, which will be covered by impermeable surfaces.

3) A stabilization program for the development describing:

A. How much of the site will be exposed during construction and what measures will be taken to reduce erosion and soil movement during construction.

B. A revegetation plan designed to return open soil areas, both preexisting and newly created, to a stable condition as soon as possible following construction and the period of time during which revegetated areas will receive revegetation maintenance.

C. Areas to be protected from vegetation loss or ground water pollution shall be identified and means for protection described.

Response: Exact locations for the transmission lines and underground collector facilities have not been determined, therefore, plan and profile drawings have not yet been completed. Transmission towers will likely be single pole towers approximately 100 to 110 feet tall. Transmission towers will be embedded in the ground and backfilled with concrete. Assuming five transmission towers will be located within the NH Zone, approximately 500 ft^2 of new impervious surface would be created, affecting a very small percentage of land within the NH Zone. Underground collector lines will not add any additional impervious surface No other impervious surface will be created within the NH Zone.

Construction of the transmission towers will require approximately 100 ft^2 per tower. Construction areas will be minimized to the greatest extent practicable by limiting staging areas to areas outside of the NH Zone. Staging areas are shown in Figure K-1.

Areas affected during construction will be revegetated after construction is completed. As described in Exhibit I of the ASC, the Project will also comply with the NPDES 1200-C permit requirements by implementing the erosion control plan submitted with the ASC.

(f) Conclusions in the Site Investigation:

1) The site investigation report shall contain conclusions stating the following:

A. How the intended use of the land is compatible with the natural conditions; and

B. Any existing or potential hazards noted during the investigation.

2) Mitigating recommendations for specific areas of concern shall be included.

3) *Conclusions shall be based on data included in the report, and the sources of information and facts relied upon shall be specifically referenced.*

Response: The detailed design geotechnical investigation to be conducted prior to the start of construction will address the conclusions described under this criterion.

6. *Standards for Building Construction in NH Zone*

(a) *Building construction shall only be approved under conditions that do not adversely affect geological stability, surface or ground waters, or vegetation.*
(b) *The grading of land and the orientation and design of buildings shall avoid creating conditions that will cause erosion or accretion of soil, or surface and ground water contamination. Where there is some risk of these conditions occurring, a Qualified Geological or Hydrological Expert, whichever is applicable, shall certify that the design and control measures will comply with this standard.*
(c) *Construction work shall be scheduled and conducted to avoid erosion, and temporary stabilization measures may be needed until permanent installations are accomplished.*

Response: The detailed design geotechnical investigation to be conducted prior to the start of construction will address the conclusions described under this criterion. Coordination with Sherman County prior to construction will ensure that these standards are met.

7. *Standards for an Access Route in a NH Zone - An access route within a (NH) Zone shall comply with the following provisions:*

(a) *A road or street shall be stabilized by planking, gravel or pavement as deemed necessary; and*
(b) *Roadways shall be built without installation of excessive fill, diversion of water, or excessive cuts unless the site investigation determines that such conditions will not be detrimental to the area or create unwarranted maintenance problems or additional hazards.*

Response: The detailed design geotechnical investigation to be conducted prior to the start of construction will address the conclusions described under this criterion. Coordination with Sherman County prior to construction will ensure that these standards are met

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: May 2008
TO: Kelly O'Brien, BP Alternative Energy
FROM: Sean Sullivan, L.A.
SUBJECT: **Addendum to Exhibit L**
PROJECT: Golden Hills Wind Farm
PROJECT NO: BPOC0000-0005
COPIES: file

Golden Hills Wind Farm LLC (Applicant) proposes to revise turbine corridors and turbine types for the Golden Hills Wind Farm. This memo summarizes changes in potential impacts to Protected Areas identified in the analysis area defined in Exhibit L. DEA used the same means and methods to determine impacts to Protected Areas as used in the application.

Noise Resulting from Facility Construction or Operation

The noise analysis for the application indicated the proposed project would be inaudible from all Protected Areas except the Columbia Basin Agricultural Resource Center in Moro. The noise analysis conducted for the application indicates the maximum noise level at the research center would be approximately 34 dBA (i.e., audible at very low levels, mostly at night). The noise analysis conducted for the addendum indicates the maximum noise level at the research center would be slightly lower at approximately 33 dBA, and still within the ODEQ threshold of 50 dBA. Therefore, changes in noise impacts resulting from proposed changes in the Addendum would be practically negligible.

Increased Traffic Resulting from Facility Construction or Operation

The proposed changes would not affect traffic resulting from facility construction or operation because its overall size and construction routes would not change. Therefore, there would be no changes in traffic impacts.

Water Use during Facility Construction or Operation

The proposed changes would not affect water use during facility construction or operation. Therefore, there would be no changes in impacts regarding water use.

Wastewater Disposal Resulting from Facility Construction or Operation

The proposed changes would not affect wastewater disposal resulting from facility construction or operation. Therefore, there would be no changes in impacts regarding wastewater disposal.

Visual Impacts of Facility Structures or Plumes

A visibility analysis of the proposed changes was conducted for the analysis area defined in Exhibit L and is attached as Figure L-1. Yellow shading indicates areas from which any portion of any turbine or transmission line would be visible, as predicted by the computer models. Blue shading indicates those areas from which the project would no longer be visible as defined by the Addendum and predicted by the models. Blue areas are insignificant and occur only in the vicinity of the easternmost turbine string. Changes in visibility and any resulting changes in impacts are practically negligible.

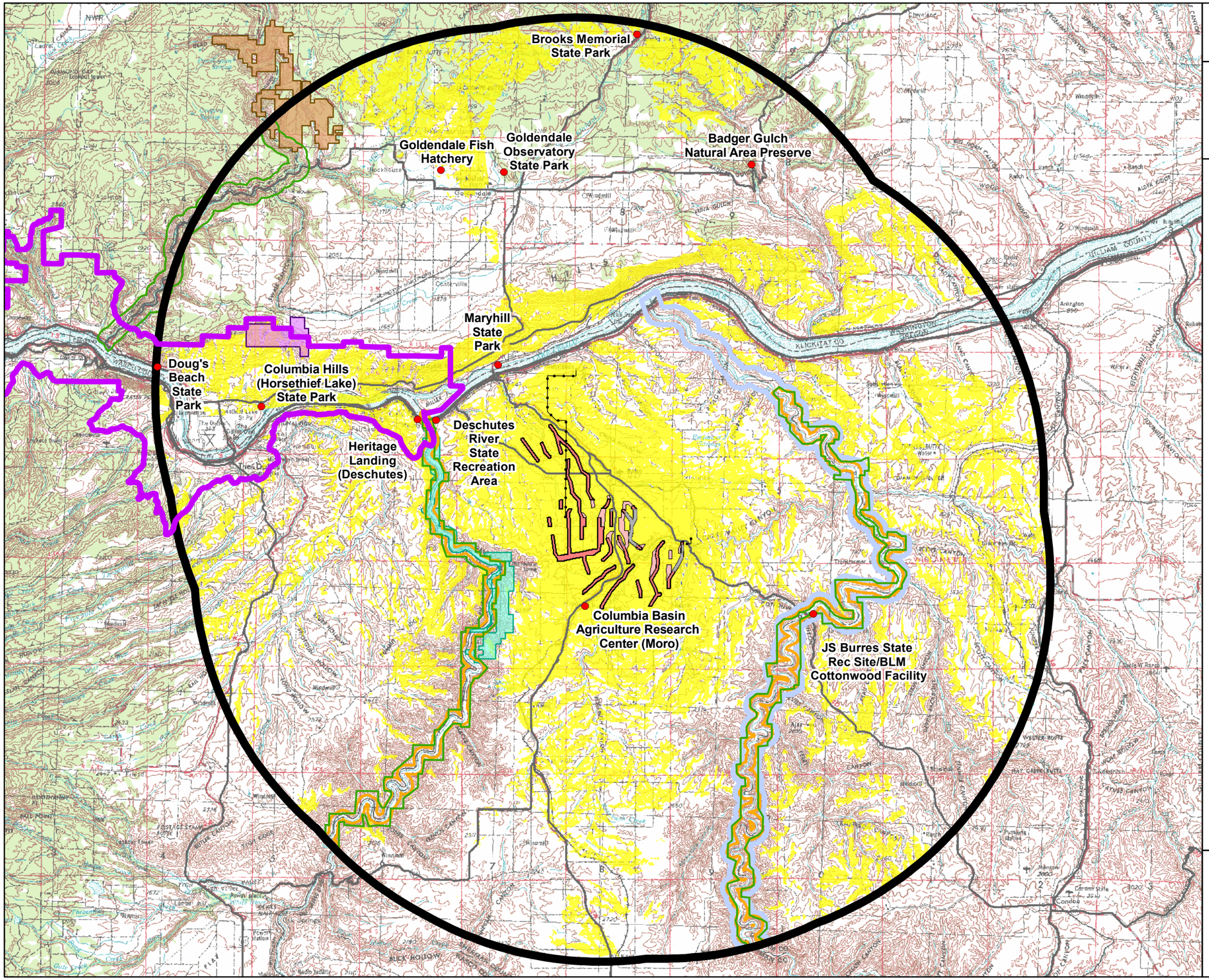
Conclusion

Given these considerations, the design, construction, operation, and retirement of the proposed facility per the addendum would not significantly affect Protected Areas in the analysis area.

Golden Hills Wind Project
Addendum to Exhibit L

FIGURE L-1

Visibility Analysis



- Site-Specific Protected Area
- Transmission Line
- John Day Wildlife Refuge
- Columbia River Gorge National Scenic Area
- Federal Wild and Scenic River
- State Scenic Waterway
- Lower Deschutes Wildlife Area
- Klickitat Wildlife Area
- Columbia Hills Natural Area Preserve
- Additional Addendum Corridor
- Removed Addendum Corridor
- Application Corridor
- Protected Areas Analysis Area
- Addendum Turbines Visible
- Application Turbines Visible

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JPMorgan

June 27, 2008

Ms. Terri Winfrey
BP Treasury, Cash & Banking Services
4101 Winfield Road
Cantera 3
Warrenville, IL 60555

Re: Golden Hills Wind Farm (GHWF)

Dear Ms. Winfrey:

BP Corporation North America Inc. (the "Parent"), has advised us that its subsidiary, BP Alternative Energy North America Inc. (the "Proposer"), has submitted a permit application to the Oregon Department of Energy to build the Golden Hills Wind Farm.

We are advised that the State of Oregon together with its agencies, branches and instrumentalities at any level, collectively, the "State" may elect to require, as security for the performance by Proposer under the permit application, a letter of credit for $16,000,000 prior to the start of construction to satisfy OAR 345-027-0020(8).

The Parent is a client of JPMorgan Chase Bank, N.A. (the "Bank"), and we currently extend an uncommitted line of credit to it under which we would presently be willing to issue a standby letter of credit for $16,000,000 as security for the performance by Proposer under its permit application with the State provided that the terms and conditions of such letter of credit are acceptable to the Bank (the "Letter of Credit"). Such Letter of Credit would be for a period of up to one year, with automatic renewals for one year unless we advise the State in advance of our election not to renew such Letter of Credit, and would be for the account of the Parent. This is not a commitment to issue any letter of credit at some future date. The issuance of the Letter of Credit in favor of the State is contingent, among other things, on the continuation and maintenance by Parent of a satisfactory credit relationship with the Bank, documentation for the letter of credit satisfactory to the Bank, as well as the continued availability of the uncommitted line of credit mentioned above.

We trust that the above information is sufficient for your purposes. The information in this letter is provided as an accommodation to the State. This letter and any information provided in connection herewith is furnished on the condition that they are strictly confidential, that no liability or responsibility whatsoever in connection herewith shall attach to the Bank or any of its affiliates or its or their respective officers, employees or agents, that this letter makes no representations regarding the general condition of either the Parent or the Proposer, its management, or its future ability to meet its obligations, and that any information provided is subject to change without notice.

Very truly yours,

James Peterson

James W. Peterson
Vice President

JPMorgan Chase Bank, N.A. • 277 Park Avenue, 39th Floor, New York, NY 10172

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: May 2008
TO: Kelly O'Brien, BP Alternative Energy
FROM: Ethan Rosenthal
SUBJECT: **Addendum to Exhibit O**
PROJECT: Golden Hills Wind Project
PROJECT NO: BPOC0000-0005
COPIES: file

Section O.3 Water Resources of the EFSC permit for the Golden Hills Wind Project has been updated and now specifies the proposed water source to be used during construction. The revised text is provided below:

O.3 SOURCES OF WATER

OAR 345-021-0010(1)(o)(B) *A description of each source of water and the Applicant's estimate of the amount of water the facility will need during construction and during operation from each source under annual average and worst-case conditions.*

Response: During construction, water that has been obtained from a contracted source will be trucked to the site. Approximately 25 million gallons will be needed during the approximately 10 month construction period. The project will contract with the City of Wasco and City of Moro, most likely as a contract between the Cities and the project construction contractor. However, if needed, the contracts could occur directly between the cities and BP Alternative Energy. Both Cities have stated that they have adequate supply to fulfill project needs. City contacts include:

Cassie Strege Wasco Water Department 541-442-5515

Rene Moore Moro Water Department 541-565-3535

During operations, water for the O&M facilities will be supplied from an exempt well (i.e., one that produces less than 5000 gallons per day) located near the O&M building.

File Name: P:\B\BPOC00000005\0600INFO\0670Reports\0672 - Application for Site Certificate\Addendum\Addendum 1 Exhibit O draft.doc

June 2008

Golden Hills Wind Project: Habitat Mitigation & Revegetation Plan

1.0 Introduction

BPAE is proposing to construct a wind power project in Sherman County, Oregon. The potential turbine strings are spread along ridgecrests located approximately 2.5 miles (mi.) northeast of the town of Wasco, Oregon. In addition to the turbine strings, additional facilities such as access roads, underground and overhead transmission lines, and a substation are being constructed to implement the project.

In the Energy Facility Application for a Site Certificate (Application) for the project, BPAE agreed to mitigate impacts associated with the loss of native shrub-steppe habitats and Conservation Reserve Program (CRP) lands. The goal for temporarily disturbed areas (such as road shoulders, underground electric cable trenches, and the temporarily disturbed area around tower sites) is to return the disturbed habitat to pre-construction (or better) conditions.

In addition to areas temporarily disturbed during construction of the project, certain areas will be permanently affected by the placement of project facilities for the life of the project. These permanently disturbed areas include the location of new or widened roads, the area under tower bases, and the substation area.

Based on the pre-construction estimates, approximately 0.91 acres of Category 2 habitat, 10.29 acres of Category 3 and 0.97 acres of Category 4 habitat will be permanently disturbed and will require mitigation. Thus, 12.17 acres of Category 2, 3 or 4 habitat will be enhanced or created. In practice this will result in a mitigation ratio slightly greater than 1:1 because expected impacts are less that the maximum possible impacts used in the pre-construction estimates. Approximately 127 acres of cultivated agriculture land may be impacted by permanent facilities. Impacts to the agriculture land will be mitigated by:

- Developing a noxious weed control plan following guidelines based upon consultation with the Sherman County Soil and Water Conservation District and ODFW. The noxious weed control plan will be approved by ODOE and finalized prior to construction.
- The noxious weed control plan will be implemented utilizing Best Management Practices (BMPs) to minimize topsoil loss, and complying with an erosion and sedimentation control plan approved by DEQ as part of the NPDES program in areas adjacent to drainage features.
- Sherman County Soil and Water Conservation District will be consulted for proper procedures for restoring agricultural quality to its original condition.

To achieve these habitat mitigation objectives, this plan has been prepared to guide revegetation efforts. Seed mixes, planting methods, and weed control techniques have been developed specifically for the project area through consultations with the affected agencies, reviews of current literature, and site visits by revegetation specialists. The plan also specifies monitoring

procedures to evaluate the success of revegetation efforts, including recommended remediative action should initial revegetation efforts prove unsuccessful in some areas.

2.0 Project Description

The Project will be located on private land in an unincorporated area of Sherman County. The Project will interconnect with the Bonneville Power Administration's (BPA) transmission system at two locations; one near Klondike Schoolhouse Substation (200 MW) and one at John Day Substation (200 MW). Transmission from the project substations to the interconnection points will involve one 4-mile long overhead transmission line and one 11-mile long overhead transmission line.

Golden Hills wind power project will consist of a number of turbine strings, with up to 267 turbines. Each turbine will likely either be a 1.65 MW or 2.5 MW capacity turbine. Hub height of the turbines will be up to approximately 80 m tall with a rotor diameter of either 82 m (1.65 MW) or 96 m (2.5 MW). Up to six permanent meteorological towers will be built. The turbines will be linked by access roads and a 34.5-kV transmission line. The 62-mile long power collection system will be largely underground, but might be overhead in some locations.

Two project substations may be built. In addition, an operations and maintenance (O&M) facility (including a shop), a control room, a maintenance yard, a kitchen, an office, a washroom, and other provisions typical of this type of facility, will be built.

This project will convert approximately 141 total acres to permanent structures and roads. Other facilities which will permanently disturb habitat include turnaround areas, substation sites, and transmission line pole bases. Less than 10% of the permanent habitat impacts will occur to CRP grassland, and native grassland and shrub-steppe habitats; the remainder of the impact will occur on cultivated land.

It will also be necessary to temporarily disturb additional areas during construction of the project. Laydown areas and equipment work areas at the tower sites will be needed to construct the turbines. Construction of access roads will also require the temporary disturbance of habitat in addition to permanent disturbance of the roadbed. Construction of powerlines, both above and below ground, will also temporarily impact habitat. For the underground lines, temporary impacts are similar to pipeline installation, while for the overhead lines, disturbance is primarily limited to the tower bases. Additionally, miscellaneous facilities such as staging areas, parking lots, and turnouts will be constructed on a temporary basis. In total, it is estimated that 1074.5 acres will be temporarily disturbed during construction; 746.2 acres of that area will be on land used for agriculture.

3.0 Site Setting

3.1 Physiography, Geology, and Soils

The turbine string sites are located on ridgetops that run along northeast-southwest lines, as well as on flat terrain. Topography in the facility area is characterized by gently rolling hills with slopes from 0° to 70°. Steeper topography is associated with the Grass Valley Canyon and associated side drainages. Elevations of the turbines strings ranges from 1,066 ft. to 2,201 ft (325 m to 671 m) above mean sea level. Soils within the project area are primarily deep, well-drained loams, and are used to cultivate small grains and hay or for livestock grazing (Macdonald et al. 1999).

3.2 Climate

Sherman County averages 11.11 inches (in.) of precipitation annually, most of which falls from October through March. Average winter snowfall is 18.9 in. The average air temperature in winter is 32.9° F and the average summer temperature is 65.4° F (Macdonald et al. 1999).

3.3 Landcover/General Vegetation

Land coverages in the project area consist primarily of cultivated agriculture (dryland wheat; 83%), followed by shrub-steppe/grassland (10%) and Conservation Reserve Program (CRP) grassland (4%), with less than 2% each of developed, riparian tree, riparian-intermittent stream (IS), upland tree, and Conservation Reserve Enhancement Program (CREP) habitats.

Vegetation communities in the project vicinity are primarily bunchgrass and shrub-steppe associations including some historic climax communities. Grasses include: bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*), Idaho fescue (*Festuca idahoensis*), and Sandberg bluegrass (*Poa secunda*). Forbs representative of these communities include arrowleaf balsamroot (*Balsamorhiza sagittata*), milkvetch (*Astragalus* sp.), lomatium (*Lomatium dissectum*), common yarrow (*Achillea millefolium*), lupine (*Lupinus* sp.), phlox (*Phlox* sp.), and pussytoes (*Antennaria* sp.). Shrub species include gray rabbitbrush (*Ericameria nauseosa*), Greene's rabbitbrush (*Ericameria greenei*), and basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*). In heavily disturbed areas, the following weedy and noxious species occur: cereal rye (*Secale cereale*), cheat grass (*Bromus tectorum*), Russian thistle (*Salsola kali*), tumblemustard (*Thelypodiopsis* sp.), China lettuce (*Lactuca serriola*), prostrate knotweed (*Polygonum aviculare*), and knapweed (*Centaurea* sp.) Much of the area has been cultivated with monoculture crops of wheat and other small grains.

3.4 Land Use

The project area is located on privately-owned land. As mentioned above, much of the area is used for agricultural activities and cattle grazing. The cultivated land is used for production of small grain crops, primarily dry land wheat and barley. The grazed land is either native shrub-steppe or land previously set aside in the federal Conservation Reserve Program.

3.5 Environmental Conditions

A variety of environmental conditions within the project area make the establishment of desirable plant species difficult. Low precipitation and sandy soils provide very little available moisture for germinating seeds. In addition, extensive past and present disturbance to the vegetative communities has created many areas dominated by non-native, weedy species. These species could spread to areas disturbed by construction activities and compete with planted species for the limited resources. Finally, high winds in the area further complicate efforts to establish desirable vegetation.

3.6 Pre Construction Inventory

The site certificate authorizes construction on corridors rather than specific turbine locations. The precise impact of construction, therefore, depends on the final project design. Therefore, prior to disturbing any area, GHWF will conduct an impact inventory, to be conducted by a qualified biologist. The pre-construction inventory will include:

- The ODFW habitat category for the area disturbed,
- The number of acres impacted,
- Photos representing the habitat,
- As assessment of dominant plant species, and
- The percentage of vegetative ground cover

4.0 Revegetation Procedures (Temporarily Disturbed Areas)

The following methods are to be used for all areas of temporary ground and/or vegetation disturbance in the upland habitats throughout the project area. Because no disturbance to wetland habitats is expected, no wetland revegetation methods have been specified.

4.1 Seed Mixture (Temporarily Disturbed Non-Agricultural Upland Areas)

As noted in section 2.0 above, the project is expected to result in temporary disturbance to approximately 279 acres of non-agricultural land, subject to verification as part of the preconstruction inventory. GHWF will reseed this area after construction. One seed mixture was developed for use in revegetating all temporarily disturbed upland habitats within the project area (Table 1). This seed mixture will be used, unless an alternative mixture is requested by a landowner, or agency biologist. The ODFW will need to approve the alternative mixture. To re-establish plant communities of most value to

wildlife, native species are included in the seed mixture, as well as certain non-native species that ODFW has determined to be beneficial to wildlife. Species were selected based on a variety of factors including tolerance to xeric conditions and seed availability.

4.2 Seed Planting Methods

Planting should be done in March--April (for disturbance that occurs during the winter and spring), and/or in October-November (for disturbance that occurs in the summer and fall). Disturbed, unseeded ground may require chemical or mechanical weed control in May or June, before weeds have a chance to go to seed.

In general, a weed-free seedbed should be prepared using conventional tillage equipment. Herbicide should be sprayed to control weedy and/or noxious species, following Oregon's buffer requirements for pesticide use (e.g., 300 feet from water sources). Summer fallowing may be required.

Areas to be seeded should be disked twice in early spring and spot-sprayed on the ground with an herbicide. This area should then be harrowed prior to seeding, ideally by the beginning of April. A conventional seed drill shall be used, except in areas where a rangeland drill is deemed more applicable, with a spacing less than 12 inches and at a depth of 1/8-1/4 inch. The prescribed seed mixture (Table 1) should be drilled at a rate of 12 pounds of pure live seed (PLS) per acre. If fallowing the area is to be used to increase soil moisture content, then the same procedure should be followed, but without seeding. If bare, disturbed soil is not seeded immediately, it will be protected from erosion. Seeding would then occur the following spring.

4.3 Restoration of Cropland

GHWF shall seed disturbed cropland areas with wheat or other cropseed. GHWF shall consult with the landowner and farm operator to determine species composition, seed and fertilizer application rates and application methods.

Cropland areas are successfully revegetated when the replanted areas achieve crop production comparable to adjacent non-disturbed cultivated areas. GHWF shall consult with the landowner or farmer to determine whether these areas have been successfully revegetated and shall report to the Department on the success of revegetation in these areas.

4.4 Revegetation Records

GHWF shall maintain a record of revegetation work for both cropland and wildlife habitat areas. In the record, GHWF shall include the date that construction activity was completed in the area to be restored, a description of the affected area (location, acres affected and pre-disturbances condition) the date that revegetation work began and a description of the work done within the affected area. GHWF shall update the revegetation records from

time to time as revegetation work occurs. GHWF shall provide copies of these records to the Department at the time it submits the annual report required under the site certificate.

4.5 Monitoring Procedures (Temporarily Disturbed Habitats)

The pre-construction inventory (section 3.6) will be repeated post-construction in the areas temporarily disturbed by construction activity to determine the success of the restoration. A qualified independent botanist or revegetation specialist hired by the certificate holder will examine a representative cross-section of plots within the revegetated areas. Following seeding, these visits will occur after the first growing season (year 1), then at year 3 and year 5. After year 5, an annual noxious weed assessment will be conducted on the site. The assessment will be made in May or June, when the largest number of weeds would be evident. If weeds are found, GHWF will make reasonable efforts to eradicate them. Care will be taken to survey areas in all the major habitat types and throughout the geographic extent of the revegetated areas. Each inventory will include:

- the ODFW habitat category for the area disturbed;
- the number of acres impacted;
- photos representing the habitat;
- an assessment of noxious weeds;
- an assessment of dominant plant species; and
- the percentage of vegetative ground cover

4.6 Success Criteria

In each monitoring report to the Department, the certificate holder shall provide an assessment of revegetation success for all previously-disturbed areas. A wildlife habitat area is successfully revegetated when its habitat quality is equal to, or better than, the habitat quality of the pre-construction ODFW habitat category of the disturbed area.

When the Department finds that the condition of a wildlife habitat area satisfies the criteria for revegetation success, the Department shall conclude that the certificate holder has met the restoration obligations for that area. If the Department finds that the landowner has converted a temporarily disturbed area to a use that is inconsistent with these success criteria, the Department shall conclude that the certificate holder has no further obligation to restore the area for wildlife habitat uses.

5.0 Habitat Improvement Procedures (Mitigation Area)

5.1 Introduction

To mitigate for permanent loss of habitat due to placement of facilities (e.g., turbines, access roads), BPAE has agreed to rehabilitate habitat on a like number of acres, of equivalent habitat quality, located in the vicinity of the project. The total amount of grassland and shrub-steppe land (including CRP) estimated to be permanently disturbed by the project, and for which mitigation is proposed for permanent impacts is 12.17 acres.

However, final impact areas will be calculated based on the pre-construction inventory described in Section 3.6. In addition, BPAE has also agreed to mitigate for indirect loss of habitat of an additional 10.45 acres of grassland/shrub-steppe habitat due to potential indirect impacts to grassland birds caused by operation of the wind project. Indirect impacts were calculated based on ODOE ratios used in previous site certificates (see attached spreadsheet). See Attachment A for a description of the habitat mitigation area. One parcel of land of similar size (approximately 22 acres) will be selected from the mitigation area for habitat enhancement based on a number of factors including:

- cost-effectiveness for quality implementation, management, and monitoring
- likelihood of successful enhancement benefiting wildlife
- willingness of landowner to participate in mitigation approach/activities

5.2 Pre-Management Inventory

- Prior to any management implementation (e.g., removal of grazing), GHWF will conduct a habitat inventory of the mitigation parcel, to be conducted by a qualified botanist or revegetation specialist. This person will examine a representative cross-section of plots within the mitigation parcel. These visits will occur yearly for the first five years, and then take place every five years for the life of the project. Care will be taken to survey areas in all the major habitat types and throughout the geographic extent of the revegetated parcel. Ten plots will be established within the mitigation site. At each plot or for the entire site, the investigator shall evaluate the following parameters:

  - The ODFW habitat categories for the entire site,
  - Photos representing the habitat at each plot,
  - As assessment of dominant plant species at each plot (Year 1, Year 5)
  - The percentage of vegetative ground cover at each plot (Year 1, Year 5)
  - Record any wildfires within the mitigation area and remedial action taken on the entire site,
  - An assessment of the presence of invasive weeds on the entire site
  - Conduct avian surveys within mitigation area with one station set up at each plot, and
  - Record observations of special status plants and animals within the mitigation area

5.3 Habitat Improvement Procedures

Once the habitat improvement parcel has been designated, the following measures will be implemented within its boundary. Ultimate responsibility for implementation and maintenance of these mitigation measures will be the responsibility of BPAE, although other parties may be subcontracted to carry out the procedures.

5.3.1 Fencing and Grazing

The parcel will be fenced prior to treatment to exclude cattle and other domestic ungulates. It is expected that regular maintenance will be required to keep the fences functioning. Gates will be installed at regular intervals along the perimeter.

GHWF shall prohibit grazing within the habitat mitigation area. Eliminating livestock grazing within the mitigation area will facilitate recovery of native bunchgrass and sagebrush in areas where past grazing has occurred, potentially resulting in better vegetative structure and complexity for a variety of wildlife.

5.3.2 Site Preparation and Planting Methods

Methods and seed mixtures used for revegetation of mitigation areas will follow those described above for temporarily disturbed areas. The mitigation site has been planted in grasses, therefore the site shall be planted and seeded using the same planting and seeding methods described for disturbed sites at sections 4.1 and 4.2 above. Ground cover canopy and height will be enhanced by the grazing exclusion.

In addition to the plantings described above, the certificate holder shall install a guzzler per ODFW specifications.

5.3.3 Maintenance

Because these improvements are mitigation for permanent habitat loss, it is necessary to maintain the fences and seedings over the life of the project (currently anticipated to be 30 years). This may include such maintenance activities as fence repair, periodic chemical or mechanical weed control, monitoring of improvement success, and re-seeding (in areas where native species establishment falls below the percentages specified in the success criteria described below).

5.3.4 Fire Control

GHWF shall implement a fire control plan for wildfire suppression within the mitigation area. GHWF shall provide a copy of the fire control plan to the Department before starting habitat enhancement actions. GHWF shall include in the plan appropriate fire prevention measures, methods to detect fires that occur and a protocol for fire response and suppression. GHWF shall maintain fire control for the life of the facility.

5.4. Post-Management Monitoring Procedures

- A qualified botanist or revegetation specialist will re-examine the mitigation parcel and compare the conditions of the site relative to the pre-management period (see section 5.2). A visit to the site will occur yearly to assess the presence of noxious weeds, and

record any wildfires within the mitigation area. If noxious weeds are found, GHWF will make reasonable efforts to eradicate them. In addition, focused monitoring will be conducted on a periodic basis to determine the success of the management measures to improve habitat. The investigator shall evaluate the following parameters:

- The ODFW habitat categories mapped and area calculated for the entire mitigation site (Year 1, 5, and every five years for life of project),
- Photos representing the habitat at each selected plot (Year 1, 5, and every five years for life of project),
- An assessment of dominant plant species at each plot (Year 1, 5, and every five years for life of project)
- The percentage of vegetative ground cover at each plot (Year 1, 5, and every five years for life of project)
- Record any wildfires within the mitigation area and remedial action taken (Annual for life of project),
- An assessment of the presence of invasive weeds on the site (Annual for life of project)
- Assess success of weed control program and recommend remedial actions if needed (Annual for life of project),
- Conduct avian surveys within mitigation area in spring (Year 5, 10, 15, 20), and
- Record observations of special status plants and animals within the mitigation area when on site

GHWF shall submit the monitoring reports with the annual report required by the site certificate.

5.5. Success Criteria

Mitigation of the permanent and temporal habitat impacts of the facility may be considered successful if the certificate holder protects and enhances sufficient habitat within the mitigation area to meet the ODFW goals of no net loss of habitat in Categories 2, 3 and 4 and a net benefit in habitat quantity or quality for impacts to habitat in Categories 2 and 5. The certificate holder must protect the quantity and quality of habitat within the mitigation area for the life of the facility.

The certificate holder shall determine the actual mitigation area requirements, subject to Department approval, before beginning construction of the GHWF. If the land selected for the mitigation area does not already contain sufficient habitat in each category to meet these requirements, then the certificate holder must demonstrate improvement of habitat quality sufficient to change lower-value habitat to a higher value (for example, to convert Category 3 habitat to Category 2). The certificate holder may demonstrate improvement of habitat quality based on evidence of indicators such as increased avian use by a diversity of species, more abundant seed production of desirable native bunchgrass, natural recruitment of sagebrush and successful weed control. If the certificate holder cannot demonstrate that the habitat mitigation area is trending toward the habitat quality

goals described above within three years, the certificate holder shall investigate the cause of the failure and report the results of the investigation to ODOE within six months after the end of the third year of operation. If the investigation shows that the site is unlikely to reach the required habitat quality, then the certificate holder shall propose an alternate site for Department approval in time for the next planting season. If the investigation shows that the cause of the failure was inadequate implementation of the habitat improvement procedures, then the certificate shall repeat those procedures and begin post implementation monitoring as before.

After the certificate holder has demonstrated that the habitat quantity goals have been achieved, the investigator shall verify, during subsequent monitoring visits, that the mitigation area continues to meet the ODFW "no net loss" and "net benefit" goals described above. The investigator shall recommend remedial action if the habitat quality within the mitigation area falls below the habitat quantity goals listed above. The Department may require other corrective measures and additional monitoring as necessary to ensure that the habitat quantity goals are achieved and maintained.

6.0 Amendment of the Plan

This Revegetation Plan may be amended from time to time by agreement of the certificate holder and the Council. Such amendments may be made without amendment of the site certificate. The Council authorizes the Office of Energy to agree to amendments to this plan. The Office of Energy shall notify the Council of all amendments, and the Council retains the authority to approve, reject or modify any amendment of this plan agreed to by the Office.

7.0 References

Macdonald, Gerald D., James M. Lamkin, and Roger H. Borine. 1999. Soil Survey of Sherman County, Oregon. Natural Resources Conservation Service, U.S. Department of Agriculture.

Table 1. Seed mixture and rate (Pure Live Seed, PLS, lbs/acre) to be used for revegetation of temporarily disturbed areas.

Common Name	Scientific Name	Pounds (PLS)/ Acre
Luna pubescent wheatgrass *	*Thinopyrum intermedium*	1
Sherman big bluegrass	*Poa ampla*	1
Magnar basin wildrye	*Leymus cinereus*	1
Whitmar beardless wheatgrass	*Pseudoroegneria spicata* ssp. *inermis*	2
Small burnett *	*Sanguisorba minor*	0.5
Alfalfa*	*Medicago sativa*	1.5
Sandberg bluegrass	*Poa secunda*	2
Idaho fescue	*Festuca idahoensis*	2
Basin big sagebrush	*Artemisia tridentata* ssp. *Tridentate*	1
TOTAL		12

* non-native species determined by ODFW to be beneficial to wildlife

ATTACHMENT-A

HABITAT MITIGATION PROJECT

GOLDEN HILLS HABITAT MITIGATION PROJECT

OFF-SITE UPLAND GRASSLAND SHRUB-STEPPE ENHANCEMENT JOHN DAY RIVER BASIN

SITE DESCRIPTION AND PROPOSED MITIGATION MANAGEMENT

John Day River Rim – Upland Grassland Shrub-steppe Enhancement

Current Condition

The mitigation area is located "off-site" approximately 5 miles southeast of the Golden Hills Wind Farm layout (Figure 1). The enhancement area is within approximately 330 acres of fenced rangeland, with large tracts of CRP located immediately to the north and south, and BLM land to the east. The entire property has been extensively grazed historically and recently by livestock, yet harbors mature big sagebrush on the hillside slopes and interior drainage. The site is at the uppermost region of the Willow Springs Canyon tributary of the John Day River, approximately two miles up-drainage of the river (Figure 1). The area selected for enhancement is approximately 21.9 acres within a 40 acre deep-soil parcel (Figure 2). The 21.9 acre enhancement area may be reduced or increased based upon finalized calculations for habitat impacts from the Golden Hills Wind Facility layout. This mitigation parcel includes an upland 1 to 7 degree slope deep-soil area classified by USDA NRCS as 1B Anderly silt loam (1-30 inch typical depth profile; Figure 3). This soil type is considered prime farmland if irrigated. The area has historically been cultivated and seeded to provide better forage for cattle, although currently non-native undesirable cheatgrass dominates the area (see Appendix A photos). Horizontal and vertical vegetative structure, especially of native grasses and forbs, is largely depleted due to livestock grazing impacts (Appendix A). The enhancement area is adjacent to CRP to the west/southwest and BLM to the north, east, and southeast. Areas on all sides of the previously cultivated area have stands of blue bunch wheatgrass, with a variety of forbs including balsamroot, big sagebrush, rigid sagebrush, phlox species, pussy toes, lupine, daisy fleabane, yarrow, and green rabbitbrush (Appendix A).

Potential for Wildlife Habitat Enhancement

This site has the potential to provide more diverse grassland in greater quantity with greater horizontal and vertical structure. If enhanced, the parcel would provide better nesting habitat for grassland bird species, including loggerhead shrikes, and also provide higher quality forage and cover for big game. Limited big game forage such as sandberg bluegrass, bluebunch wheatgrass, and various forbs, would be enhanced with livestock exclusion providing better fall, winter, and early spring rangeland for big game. Summer habitat for ground-nesting birds would also be

enhanced. Enhancement would also likely provide better hunting grounds for raptors as well. Due to the elevational gradient and mixed soil depths, the site has the potential to provide several different quality ecotones.

Proposed Management for Enhancement

Eradication or control of non-desirable invasive/noxious species would be conducted by either using small controlled prescribed burns or spot spraying with herbicide. The area would be reclaimed for desirable grassland/shrub-steppe wildlife habitat using the revegetation methods described in section 4.0 of the Golden Hills Wind Farm revegetation plan for temporarily disturbed upland non-agriculture lands. The entire mitigation parcel would be fenced off and not grazed by domestic livestock. Given the selected mitigation parcel is currently heavily grazed and predominantly cheatgrass, there exists a high potential for successful reclamation of high quality wildlife habitat. In addition, a water catchment ("guzzler") would be installed providing a water source for wildlife. Prior to any land management change, the ecological condition of the site should be assessed using Oregon protocols for rangeland inventory and evaluation (USDA 2004). This assessment would include photo documentation of the site with additional notes regarding wildlife habitat condition. Post-management site assessment, for example every 5 years, should also be agreed upon by ODFW allowing adaptive management needs.

Advantages

This site lacks public road access and is remote and infrequently disturbed by humans, used largely for hunting by landowner only. The site is approximately 5 miles from the proposed Golden Hills Wind Farm (Figure 1). The landowner has expressed willingness to enter into at least a 25 year conservation easement agreement for the site. The enhancement parcel has suitable soils for successful seeding and is surrounded by existing stands of grassland/shrub-steppe. The area is adjacent to a watershed with riparian habitat to the north, and cliff and riparian corridor habitat of the John Day River to the east; enhancing landscape-level wildlife forage, thermal and security cover, and water. This location presents the opportunity to enhance grassland/shrub-steppe quality and quantity that is limited in availability for wildlife. Successful enhancement would provide greater connectivity between adjacent large tracts of CRP and BLM lands, creating a larger overall mosaic of quality wildlife habitat.

Reference

USDA. 2004. National Range and Pasture Handbook: Amendment 2 600.0401a; Oregon Protocols for Rangeland and Pature / Hayland Inventory and Evaluation. United States Department of Agriculture, Natural Resources Conservation Service, Grazing Lands Technology Institute.

Figure 1. Miller property with mitigation area in relation to the Golden Hills Wind Farm location.

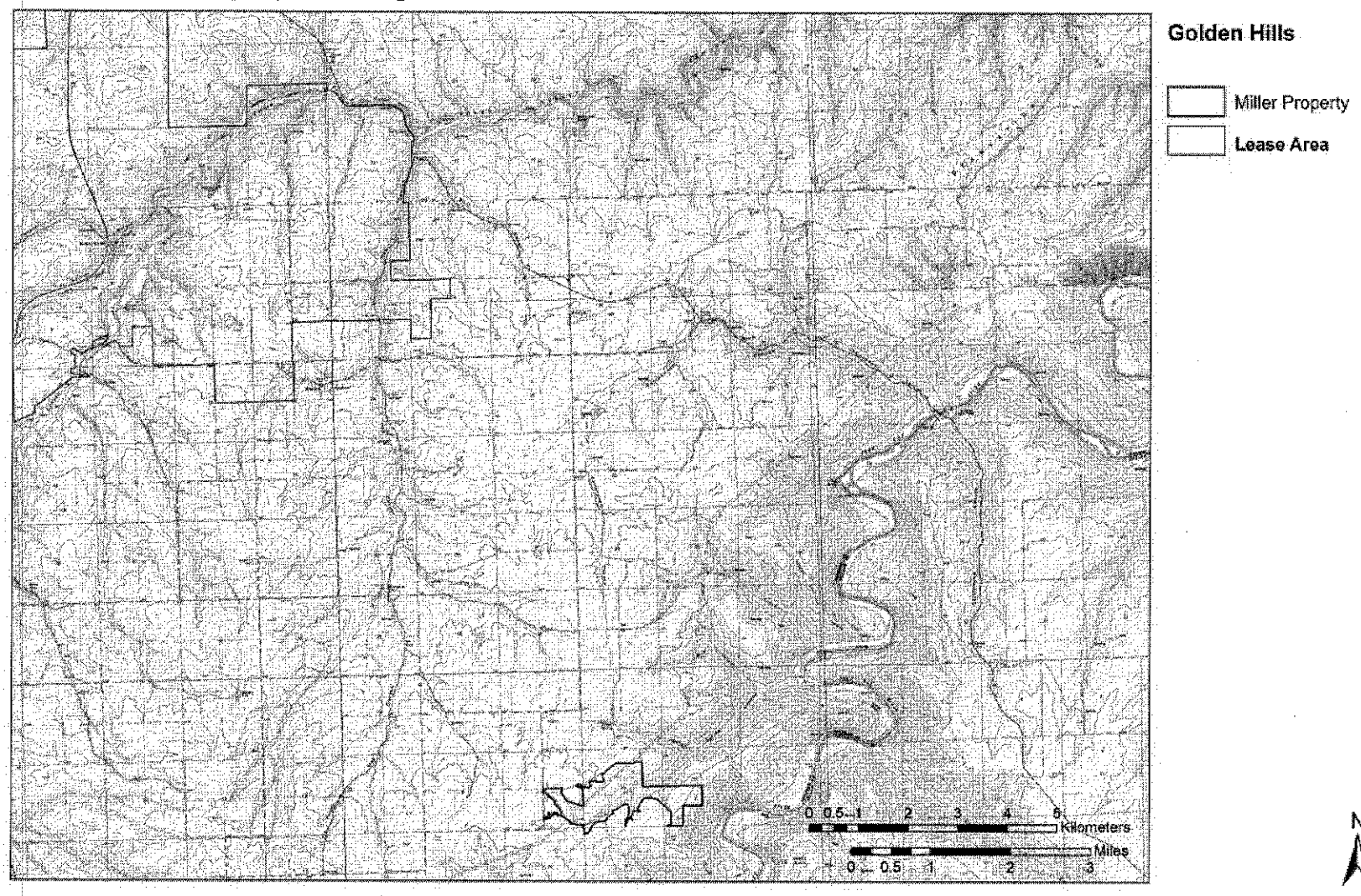
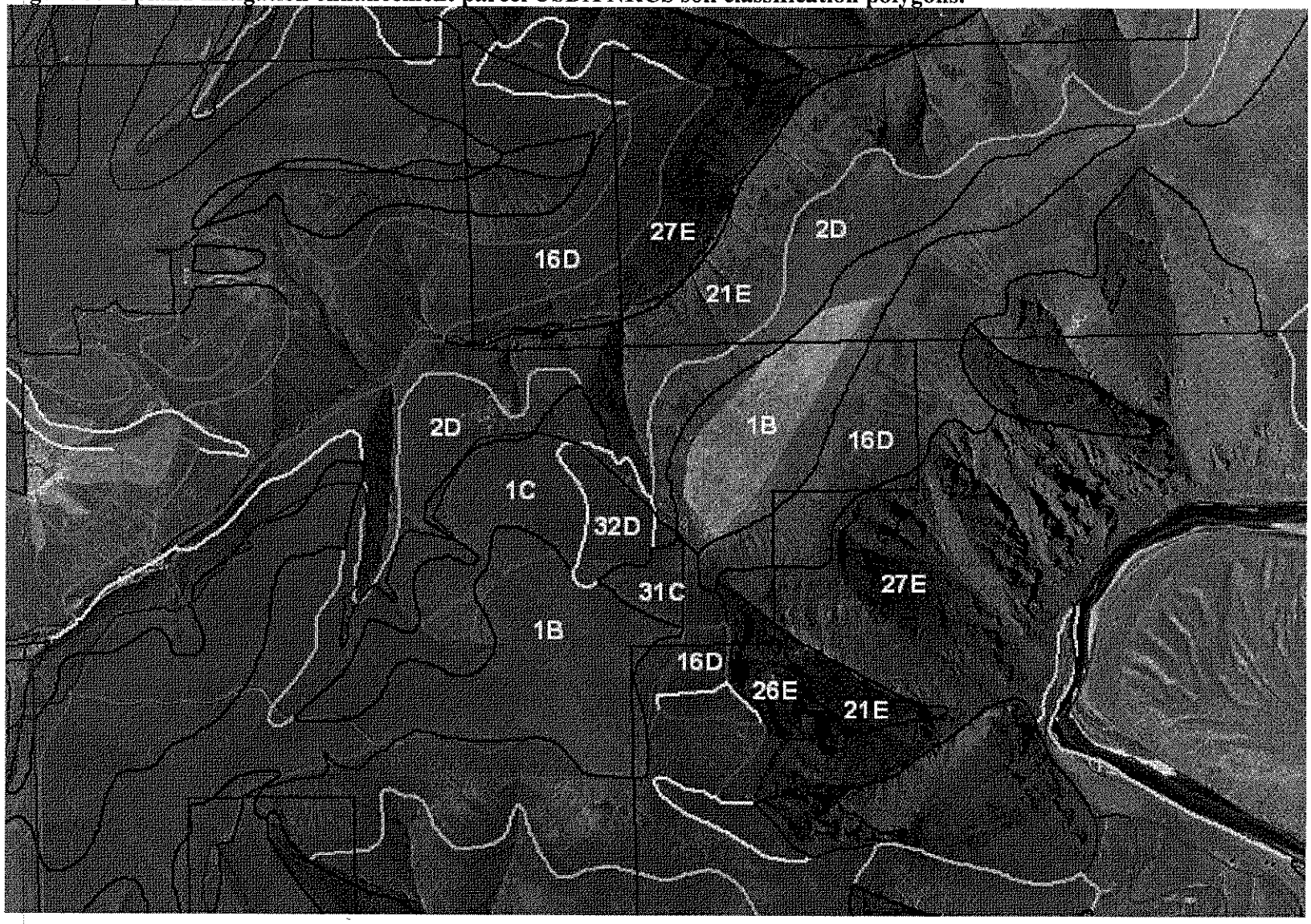


Figure 2. Upland mitigation enhancement parcel within the Miller property rangeland area.

Figure 3. Upland mitigation enhancement parcel USDA NRCS soil classification polygons.



Appendix A (Photo Sites 408-412). Mitigation Enhancement Parcel pictures of vegetation and grazing impacts.
PHOTO SITE 408 – ENHANCEMENT PARCEL WITH ADJACENT BUNCHGRASS

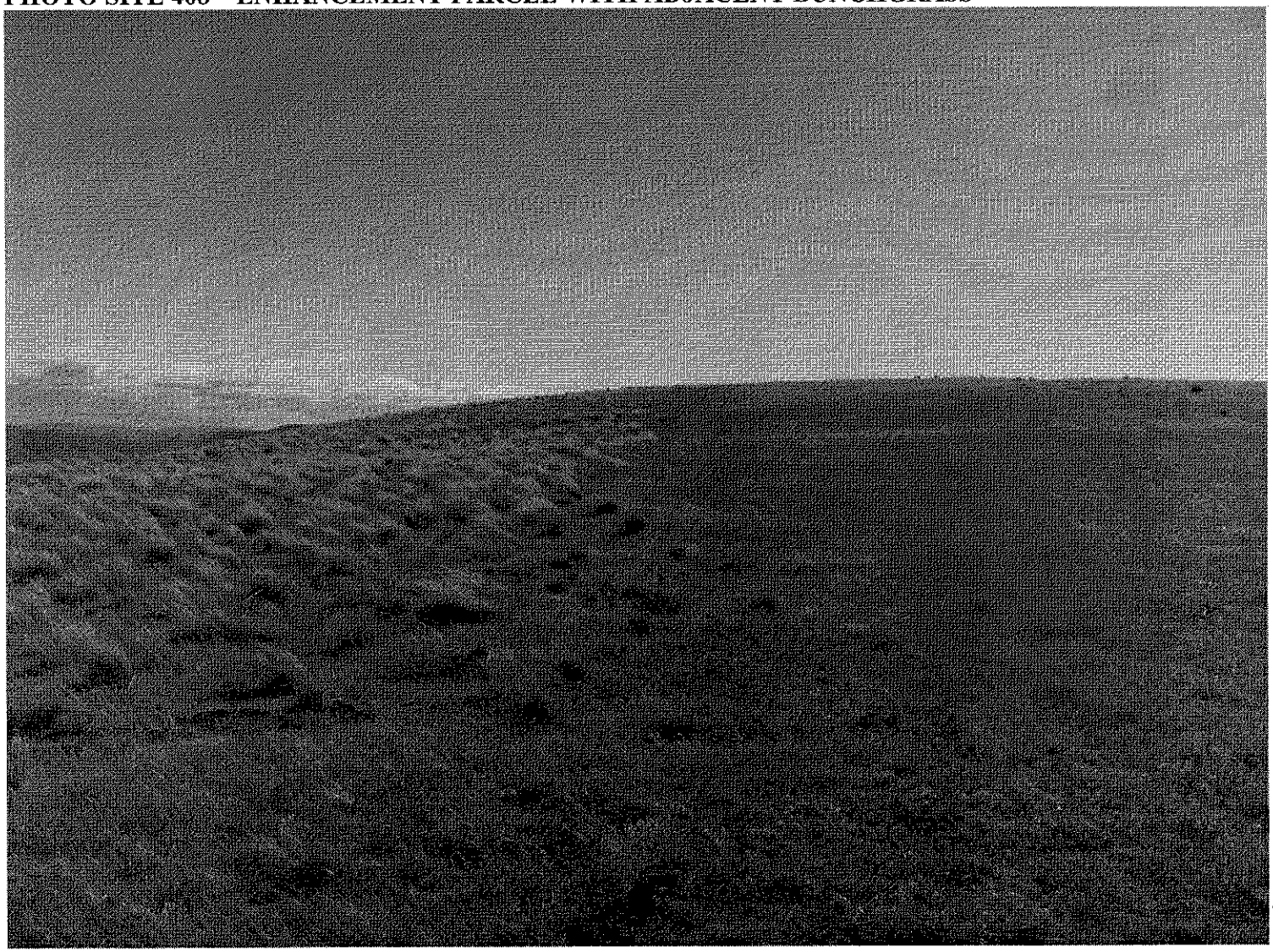


PHOTO SITE 409 – ENHANCEMENT PARCEL WITH ADJACENT BUNCHGRASS (FOREGROUND)

PHOTO SITE 410 – ENHANCEMENT PARCEL

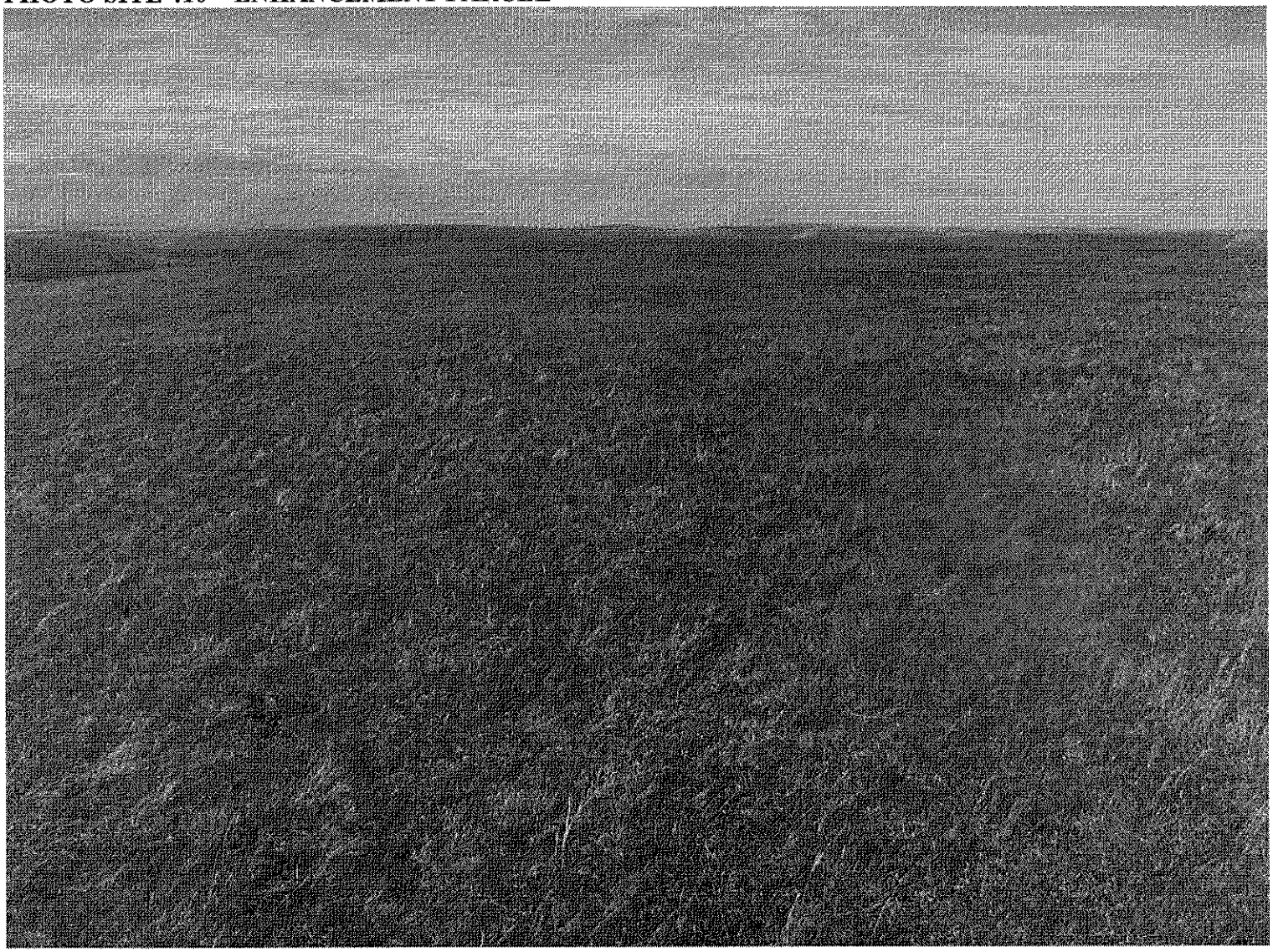
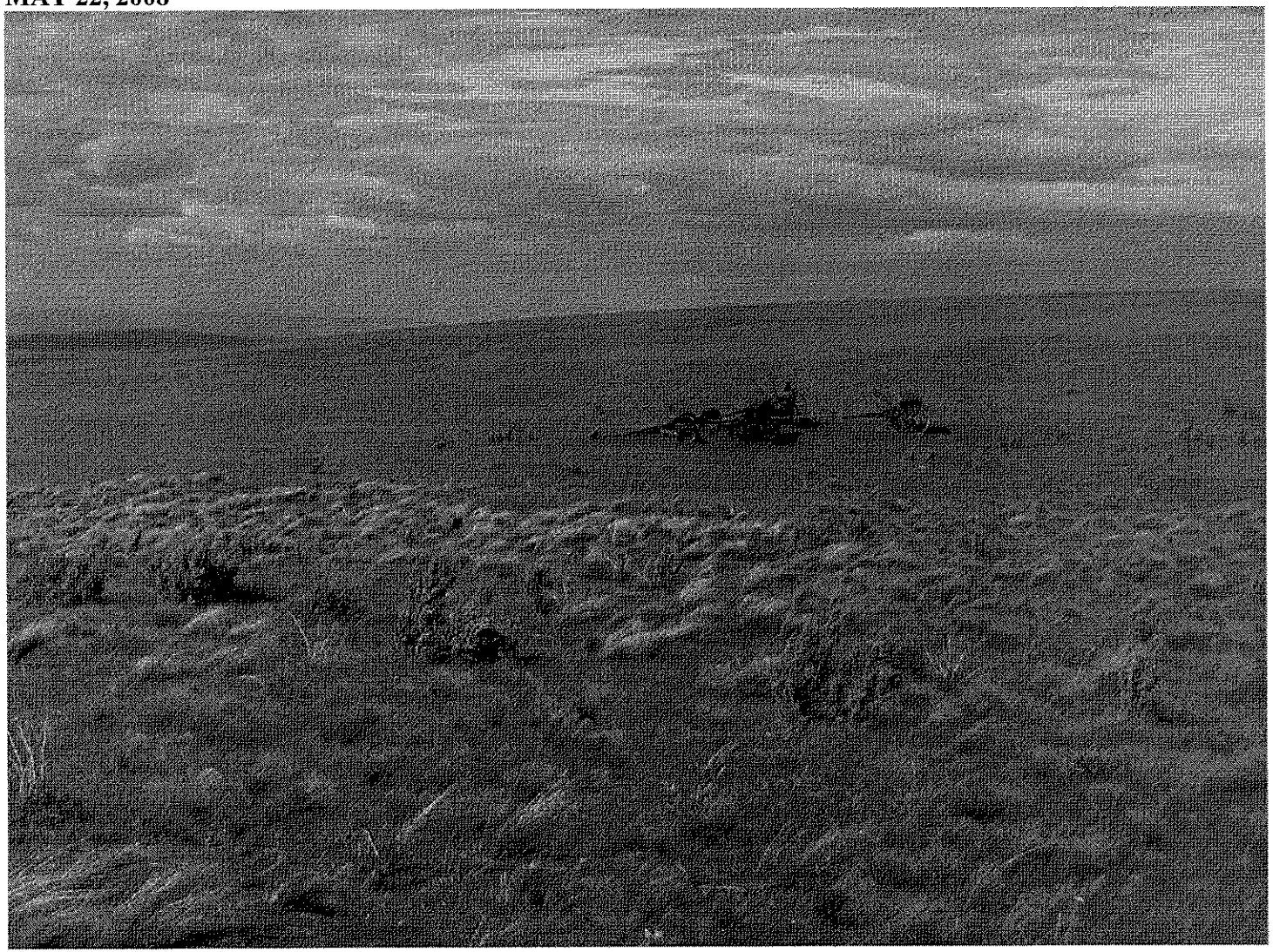


PHOTO SITE 411 – ENHANCEMENT PARCEL WITH ADJACENT BUNCHGRASS

PHOTO SITE 412 – ENHANCEMENT PARCEL

PHOTO – ENHANCEMENT PARCEL WITH CATTLE GRAZING MAY 22, 2008

PHOTO – ENHANCEMENT PARCEL WITH ADJACENT SAGEBRUSH/BUNCHGRASS (FOREGROUND) AND DRILL MAY 22, 2008



GOLDEN HILLS WIND FARM: WILDLIFE MONITORING AND MITIGATION PLAN
[AUGUST 2008]

This plan describes wildlife monitoring that the certificate holder shall conduct during operation of the Golden Hills Wind Farm (GHWF).[1] The monitoring objectives are to determine whether operation of the facility causes significant fatalities of birds and bats and to determine whether the facility results in a loss of habitat quality. Golden Hills wind power project consists of a number of turbine strings, with up to 267 turbines. Each turbine will likely either be a 1.65 MW or 2.5 MW capacity turbine. Hub height of the turbines will be up to approximately 80 (m) tall with a rotor diameter of either 82m (1.65 MW) or 96m (2.5 MW). Up to six permanent meteorological towers will be built. The turbines will be linked by access roads and a 34.5-kV transmission line. The 62-mile long power collection system will be largely underground, but might be overhead in some locations.

The certificate holder shall use experienced personnel to manage the monitoring required under this plan and properly trained personnel to conduct the monitoring, subject to approval by the Oregon Department of Energy (Department) as to professional qualifications. For all components of this plan except the Raptor Nesting Surveys and the Wildlife Incident Response and Handling System, the certificate holder shall direct a qualified independent third-party biological monitor, as approved by the Department, to perform monitoring tasks.

The Wildlife Monitoring and Mitigation Plan for the GHWF has the following components:

1) Fatality Monitoring Program including:
    a) Removal Trials
    b) Searcher Efficiency Trials
    c) Fatality Monitoring Search Protocol
    d) Statistical Analysis
2) Raptor Nesting Surveys
3) Avian Use and Behavior Surveys
4) Wildlife Incident Response and Handling System

Following is a discussion of the components of the monitoring plan, statistical analysis methods for fatality data, data reporting and potential mitigation.

The selection of the mitigation actions that the certificate holder may be required to implement under this plan should allow for flexibility in creating appropriate responses to monitoring results that cannot be known in advance. If the Department determines that mitigation is needed, the certificate holder shall propose appropriate mitigation actions to the Department and shall carry out mitigation actions approved by the Department, subject to review by the Oregon Energy Facility Council (Council).

[1] This plan is incorporated by reference in the site certificate for the BCWF and must be understood in that context. It is not a "stand-alone" document. This plan does not contain all mitigation required of the certificate holder.

1. Fatality Monitoring

(a) Definitions and Methods

Seasons

This plan uses the following dates for defining seasons:

Season	Dates
Spring Migration	March 16 to May 15
Summer/Breeding	May 16 to August 15
Fall Migration	August 16 to October 31
Winter	November 1 to March 15

Search Plots

The certificate holder shall conduct fatality monitoring within search plots. The certificate holder, in consultation with the Oregon Department of Fish and Wildlife (ODFW), will select search plots based on a systematic sampling design that ensures the selected search plots are representative of the habitat in different parts of the site. Each search plot will contain one turbine. Search plots will be square or circular. Circular search plots will be centered on the turbine location and will have a radius equal to the maximum blade tip height of the turbine contained within the plot. "Maximum blade tip height" is the turbine hub-height plus one-half the rotor diameter. Square search plots will be of sufficient size to contain a circular search plot as described above.

The certificate holder shall provide maps of the search plots to the Department and ODFW before beginning fatality monitoring at the facility. The certificate holder will use the same search plots for each search conducted during each monitoring year. During the second monitoring year, new search plots will be selected from the turbines not sampled during the first monitoring year.

Sample Size

The sample size for fatality monitoring is the number of turbines searched per monitoring year. The certificate holder shall conduct fatality monitoring during the each monitoring year in search plots at 1/3 of the turbines. If fewer than 150 turbines are built, GHWF shall monitor a minimum of 50 turbines.

As described in Exhibit B of the ASC, GHWF may choose a combination of smaller turbines with rotor diameter of 82 meters, or larger turbines with rotor diameter greater than 82 meters. If the final design of GHWF includes both large and small turbines, then GHWF shall, before beginning fatality monitoring, consult with an independent expert with experience in statistical analysis of avian fatality data to determine whether it would be possible to design a 50-turbine sample with a sufficient number of turbines in each size class to allow statistical comparison of fatality rates for all birds as a group. GHWF shall submit the expert's written analysis to the Department. If the analysis shows that a comparison study is possible and if the Department approves, GHWF shall sample the appropriate number of turbines in each class and conduct the comparison study. GHWF may choose to sample more than 50 turbines in a each monitoring year, if a larger sample size would allow the comparison study to be done.

Scheduling and Sampling Frequency

Fatality monitoring will begin upon the commencement of commercial operation of the facility.

The first fatality monitoring year will commence on the first day of the month following the commercial operation date of the facility and will conclude twelve months later (for example, if commercial operation begins in October of 2008, the monitoring year will commence on November 1, 2008, and conclude on October 31, 2009). Subsequent monitoring years will follow the same schedule (for example, the second monitoring year would begin November 1 of the year in which monitoring is performed, and conclude October 31 of the following year)

In each monitoring year, the certificate holder shall conduct fatality-monitoring searches at the rates of frequency shown below. Over the course of one monitoring year, the certificate holder would conduct 16 searches[2], as follows:

Season	Frequency
Spring Migration	2 searches per month (4 searches)
Summer/Breeding	1 search per month (3 searches)
Fall Migration	2 searches per month (5 searches)
Winter	1 search per month (4 searches)

Duration of Fatality Monitoring

GHWF shall perform one complete monitoring cycle during its first full year of operation. At the end of the first year of monitoring, GHWF will report the results for joint evaluation by ODOE, GHWF and ODFW. In the evaluation, results for GHWF will be compared with the threshold table in section 1(g) of this plan, and with analogous fatality monitoring results for Klondike III, Biglow Canyon, Combine Hills, Nine Canyon, Hopkins Ridge and, if available, Leaning Juniper. Fatality monitoring results from other wind power facilities in the Columbia Basin may also be included, if available. If fatality results for the first year of monitoring at GHWF do not exceed any of the thresholds of concern and are within the range of all results from the facilities listed above, then GHWF will perform its second year of monitoring in year 5 of operations.

Otherwise, GHWF shall propose additional mitigation within 6 months, for ODOE and ODFW review. Alternately, GHWF may opt to perform a second year of fatality monitoring immediately if it believes that the results of year 1 monitoring were anomalous. If GHWF takes this option, then it will still perform the monitoring in year 5 of operations described above.

Meteorological Towers

The facility will most likely use non-guyed meteorological towers. Non-guyed towers are known to cause little if any bird and bat mortality. Therefore, monitoring will not occur at non-guyed meteorological towers. If the meteorological towers are guyed, the certificate holder shall search all towers on the same monitoring schedule as fatality monitoring. The certificate holder

[2] GHWF may omit the searches on some turbines, if searches are not possible due to safety reasons .

will use circular search plots. The radius of the circular search plots will extend a minimum of 5 meters beyond the most distant guy wire anchor point.

(b) Removal Trials

The objective of the removal trials is to estimate the length of time avian and bat carcasses remain in the search area. Carcass removal studies will be conducted during each season in the vicinity of the search plots. Estimates of carcass removal rates will be used to adjust carcass counts for removal bias. "Carcass removal" is the disappearance of a carcass from the search area due to predation, scavenging or other means such as farming activity. Removal rates will be estimated by size class, habitat and season.

During the first year, the certificate holder shall conduct carcass removal trials within each of the seasons defined above during the years in which fatality monitoring occurs. During the first year in which fatality monitoring occurs, trials will occur in at least eight different calendar weeks in a year, with at least one calendar week between starting dates. Trials will be spread throughout the year to incorporate the effects of varying weather, farming practices and scavenger densities. At least two trials will be started in each season. Each trial will use at least 6 carcasses. For each trial, 3 small bird carcasses and 3 large bird carcasses will be distributed in cultivated agriculture habitat and 3 small bird carcasses and 3 large bird carcasses will be distributed in non-cultivated habitat (grassland/shrub-steppe and CRP). In a year, approximately 48 carcasses will be placed in cultivated agriculture and 48 carcasses in non-cultivated grassland/shrub-steppe and CRP for a total of about 96 trial carcasses. The number of removal trials may be adjusted up or down during the second year of fatality monitoring, subject to approval by the Department, if the certificate holder can demonstrate that the calculation of fatality rates will continue to have statistical validity with the new sample size.

The "small bird" size class will use carcasses of house sparrows, starlings, commercially available game bird chicks or legally obtained native birds to simulate passerines. The "large bird" size class will use carcasses of raptors provided by agencies, commercially available adult game birds or cryptically colored chickens to simulate raptors, game birds and waterfowl. If fresh bat carcasses are available, they may also be used.

To avoid confusion with turbine-related fatalities, planted carcasses will not be placed in fatality monitoring search plots. Planted carcasses will be placed in the vicinity of search plots but not so near as to attract scavengers to the search plots. The planted carcasses will be located randomly within the carcass removal trial plots.

Carcasses will be placed in a variety of postures to simulate a range of conditions. For example, birds will be: 1) placed in an exposed posture (e.g., thrown over the shoulder), 2) hidden to simulate a crippled bird (e.g., placed beneath a shrub or tuft of grass) and, 3) partially hidden. Trial carcasses will be marked discreetly for recognition by searchers and other personnel. Trial carcasses will be left at the location until the end of the carcass removal trial.

It is expected that carcasses will be checked as follows, although actual intervals may vary. Carcasses will be checked for a period of 40 days to determine removal rates. They will be checked about every day for the first 4 days, and then on day 7, day 10, day 14, day 20, day 30 and day 40. This schedule may vary depending on weather and coordination with the other survey work. At the end of the 40-day period, the trial carcasses and scattered feathers will be removed.

(c) Searcher Efficiency Trials

The objective of searcher efficiency trials is to estimate the percentage of bird and bat fatalities that searchers are able to find. The certificate holder shall conduct searcher efficiency trials on the fatality monitoring search plots in both grassland/shrub-steppe and cultivated agriculture habitat types. Searcher efficiency will be estimated by size class, habitat type and season. Estimates of searcher efficiency will be used to adjust carcass counts for detection bias.

Searcher efficiency trials will be conducted in each season as defined above, during the years in which the fatality monitoring occurs. Trials will be spread throughout the year to incorporate the effects of varying weather, farming practices and scavenger densities. At least two trials will be conducted in each season. Each trial will use about 12 carcasses, although the number will be variable so that the searcher will not know the total number of trial carcasses being used in any trial. For each trial, both small bird and large bird carcasses will be used in about equal numbers. "Small bird" and "large bird" size classes and carcass selection are as described above for the removal trials. An equal proportion of the trial carcasses will be distributed in cultivated agriculture habitat and in non-cultivated habitat (grassland/shrub steppe and CRP). In a year, about 48 carcasses will be placed in cultivated agriculture and about 48 in non-cultivated grassland/shrub steppe and CRP for a total of about 96 trial carcasses. The number of searcher efficiency trials may be reduced to one per season during the second year of fatality monitoring, subject to approval by the Department, if the certificate holder can demonstrate that the calculation of fatality rates will continue to have statistical validity with the reduced sample size.

Personnel conducting searches will not know in advance when trials are conducted; nor will they know the location of the trial carcasses. If suitable trial carcasses are available, trials during the fall season will include several small brown birds to simulate bat carcasses. Legally obtained bat carcasses will be used if available.

On the day of a standardized fatality monitoring search (described below) but before the beginning of the search, efficiency trial carcasses will be placed at random locations within areas to be searched. If scavengers appear attracted by placement of carcasses, the carcasses will be distributed before dawn.

Searcher efficiency trials will be spread over the entire season to incorporate effects of varying weather and vegetation growth. Carcasses will be placed in a variety of postures to simulate a range of conditions. For example, birds will be: 1) placed in an exposed posture (thrown over the shoulder), 2) hidden to simulate a crippled bird and 3) partially hidden.

Each non-domestic carcass will be discreetly marked so that it can be identified as an efficiency trial carcass after it is found. The number and location of the efficiency trial carcasses found during the carcass search will be recorded. The number of efficiency trial carcasses available for detection during each trial will be determined immediately after the trial by the person responsible for distributing the carcasses.

If new searchers are brought into the search team, additional detection trials will be conducted to ensure that detection rates incorporate searcher differences. If GHWF does not perform a second year of monitoring until the 5th year of operation, then searcher efficiency and removal trials shall be repeated to ensure that the removal and detection rates used to estimate

overall fatalities account for new searchers and changed predation or scavenger behavior patterns.

(d) Coordination with the other Wind Projects

It is anticipated that other wind projects in Sherman County may be monitored at the same time that Golden Hills is monitored. If these projects are permitted through EFSEC, they will require similar wildlife monitoring. Subject to the approval of both certificate holders and the Department, the number of trials at each site and the number of trial carcasses used at each site can be reduced by combining the removal data and efficiency data from multiple facilities, if the certificate holder can demonstrate that the calculation of fatality rates will continue to have statistical validity for both facilities and that combining the data will not affect any other requirements of the monitoring plans for either facility.

(e) Fatality Monitoring Search Protocol

The objective of fatality monitoring is to estimate the number of bird and bat fatalities that are attributable to facility operation and associated variances. The certificate holder shall conduct fatality monitoring using standardized carcass searches.

The certificate holder shall use a worst-case analysis to resolve any uncertainty in the results and to determine whether the data indicate that additional mitigation should be considered. The Department may require additional, targeted monitoring if the data indicate the potential for significant impacts that cannot be addressed by worst-case analysis and appropriate mitigation.

The certificate holder shall estimate the number of avian and bat fatalities attributable to operation of the facility based on the number of avian and bat fatalities found at the facility site. All carcasses located within areas surveyed, regardless of species, will be recorded and, if possible, a cause of death determined based on blind necropsy results. If a different cause of death is not apparent, the fatality will be attributed to facility operation. The total number of avian and bat carcasses will be estimated by adjusting for removal and searcher efficiency bias.

Personnel trained in proper search techniques ("the searchers") will conduct the carcass searches by walking parallel transects within the search plots.[3] Transects will be initially set at 6 meters apart in the area to be searched. A searcher will walk at a rate of about 45 to 60 meters per minute along each transect searching both sides out to three meters for casualties. Search area and speed may be adjusted by habitat type after evaluation of the first searcher efficiency trial. The searchers will record the condition of each carcass found, using the following condition categories:

- Intact – a carcass that is completely intact, is not badly decomposed and shows no sign of being fed upon by a predator or scavenger
- Scavenged – an entire carcass that shows signs of being fed upon by a predator or scavenger, or portions of a carcass in one location (e.g., wings, skeletal remains, legs, pieces of skin, etc.)

[3] Where search plots are adjacent, the search area may be rectangular.

- Feather Spot – 10 or more feathers at one location indicating predation or scavenging or 2 or more primary feathers

All carcasses (avian and bat) found during the standardized carcass searches will be photographed as found, recorded and labeled with a unique number. Distance from observer to the carcass will be measured (to the nearest 0.25 meters), as will the perpendicular distance from the transect line to the carcass. Each carcass will be bagged and frozen for future reference and possible necropsy. A copy of the data sheet for each carcass will be kept with the carcass at all times. For each carcass found, searchers will record species, sex and age when possible, date and time collected, location, condition (e.g., intact, scavenged, feather spot) and any comments that may indicate cause of death. Searchers will map the find on a detailed map of the search area showing the location of the wind turbines and associated facilities such as power lines. The certificate holder shall coordinate collection of state endangered, threatened, sensitive or other state protected species with ODFW. The certificate holder shall coordinate collection of federally-listed endangered or threatened species and Migratory Bird Treaty Act protected avian species with the U.S. Fish and Wildlife Service (USFWS). The certificate holder shall obtain appropriate collection permits from ODFW and USFWS.

The searchers might discover carcasses incidental to formal carcass searches (e.g., while driving within the project area). For each incidentally discovered carcass, the searcher shall identify, photograph, record data and collect the carcass as would be done for carcasses within the formal search sample during scheduled searches

If the incidentally discovered carcass is found within a formal search plot, the fatality data will be included in the calculation of fatality rates. If the incidentally discovered carcass is found outside a formal search plot, the data will be reported separately.

The certificate holder shall coordinate collection of incidentally discovered state endangered, threatened, sensitive or other state protected species with ODFW. The certificate holder shall coordinate collection of incidentally discovered federally-listed endangered or threatened species and Migratory Bird Treaty Act protected avian species with the USFWS.

The certificate holder shall develop and follow a protocol for handing injured birds. Any injured native birds found on the facility site will be carefully captured by a trained project biologist or technician and transported to Jean Cypher (wildlife rehabilitator) in The Dalles, the Blue Mountain Wildlife Rehabilitation Center in Pendleton or the Audubon Bird Care Center in Portland in a timely fashion.[4] The certificate holder shall pay costs, if any are charged, for time and expenses related to care and rehabilitation of injured native birds found on the site, unless the cause of injury is clearly demonstrated to be unrelated to the facility operations.

(f) Statistical Methods for Fatality Estimates

The estimate of the total number of wind facility-related fatalities is based on:

(1) The observed number of carcasses found during standardized searches during the two monitoring years for which the cause of death is attributed to the facility.[5]

[4] The people and centers listed here may be changed with Department approval.
[5] If a different cause of death is not apparent, the fatality will be attributed to facility operation.

(2) Searcher efficiency expressed as the proportion of planted carcasses found by searchers.

(3) Non-removal rates expressed as the estimated average probability a carcass is expected to remain in the study area and be available for detection by the searchers during the entire survey period.

Definition of Variables

The following variables are used in the equations below:

c_i	the number of carcasses detected at plot i for the study period of interest (e.g., one year) for which the cause of death is either unknown or is attributed to the facility
n	the number of search plots
k	the number of turbines searched (includes the turbines centered within each search plot and a proportion of the number of turbines adjacent to search plots to account for the effect of adjacent turbines on the 90-meter search plot buffer area)
$\bar{c}$	the average number of carcasses observed per turbine per year
s	the number of carcasses used in removal trials
s_c	the number of carcasses in removal trials that remain in the study area after 40 days
se	standard error (square of the sample variance of the mean)
t_i	the time (days) a carcass remains in the study area before it is removed
$\bar{t}$	the average time (days) a carcass remains in the study area before it is removed
d	the total number of carcasses placed in searcher efficiency trials
p	the estimated proportion of detectable carcasses found by searchers
I	the average interval between searches in days
$\hat{\pi}$	the estimated probability that a carcass is both available to be found during a search and is found
m_t	the estimated annual average number of fatalities per turbine per year, adjusted for removal and observer detection bias
C	nameplate energy output of turbine in megawatts (MW)

Observed Number of Carcasses

The estimated average number of carcasses ($\bar{c}$) observed per turbine per year is:

$$\bar{c} = \frac{\sum_{i=1}^{n} c_i}{k}. \qquad (1)$$

Estimation of Carcass Removal

Estimates of carcass removal are used to adjust carcass counts for removal bias. Mean carcass removal time ($\bar{t}$) is the average length of time a carcass remains at the site before it is removed:

$$\bar{t} = \frac{\sum_{i=1}^{s} t_i}{s - s_c}. \quad (2)$$

This estimator is the maximum likelihood estimator assuming the removal times follow an exponential distribution and there is right-censoring of data. Any trial carcasses still remaining at 40 days are collected, yielding censored observations at 40 days. If all trial carcasses are removed before the end of the trial, then s_c is 0, and $\bar{t}$ is just the arithmetic average of the removal times. Removal rates will be estimated by carcass size (small and large) and season.

Estimation of Observer Detection Rates

Observer detection rates (i.e., searcher efficiency rates) are expressed as *p*, the proportion of trial carcasses that are detected by searchers. Observer detection rates will be estimated by carcass size and season.

Estimation of Facility-Related Fatality Rates

The estimated per turbine annual fatality rate (m_t) is calculated by:

$$m_t = \frac{\bar{c}}{\hat{\pi}}, \quad (3)$$

where $\hat{\pi}$ includes adjustments for both carcass removal (from scavenging and other means) and observer detection bias assuming that the carcass removal times t_i follow an exponential distribution unless a different assumption about carcass removal is made with the approval of the Department. Under these assumptions, this detection probability is estimated by:

$$\hat{\pi} = \frac{\bar{t} \cdot p}{I} \cdot \left[\frac{\exp\left(I/\bar{t}\right) - 1}{\exp\left(I/\bar{t}\right) - 1 + p} \right]. \quad (4)$$

The estimated per MW annual fatality rate (m) is calculated by:

$$m = \frac{m_t}{C}. \quad (5)$$

The certificate holder shall calculate fatality estimates for: (1) all birds, (2) small birds, (3) large birds, (4) raptors, (5) target grassland birds, (6) nocturnal avian migrants, 7) avian State Sensitive Species listed under OAR 635-100-0040, and 8) bats. The final reported estimates of *m*, associated standard errors and 90% confidence intervals will be calculated using bootstrapping (Manly 1997). Bootstrapping is a computer simulation technique that is useful for calculating point estimates, variances and confidence intervals for complicated test statistics. For each iteration of the bootstrap, the plots will be sampled with replacement, trial carcasses will be sampled with replacement and $\bar{c}$, $\bar{t}$, p, $\hat{\pi}$ and m will be calculated. A total of 5,000 bootstrap iterations will be used. The reported estimates will be the means of the 5,000 bootstrap estimates. The standard deviation of the bootstrap estimates is the estimated standard error. The lower 5th

and upper 95th percentiles of the 5000 bootstrap estimates are estimates of the lower limit and upper limit of 90% confidence intervals.

Nocturnal Migrant and Bat Fatalities

Differences in observed nocturnal avian migrant and bat fatality rates for lit turbines, unlit turbines that are adjacent to lit turbines, and unlit turbines that are not adjacent to lit turbines will be compared graphically and statistically.

(g) Mitigation

Mitigation may be appropriate if analysis of the fatality data collected after the first monitoring year shows fatality rates for avian species that exceed a threshold of concern. For the purpose of determining whether a threshold has been exceeded, the certificate holder shall calculate the average annual fatality rates for the species groups after the initial two years of monitoring. Based on current knowledge of the species that are likely to use the habitat in the area of the facility, the following thresholds apply to the GHWF:

Species Group	**Threshold of Concern** (fatalities per MW)
Raptors (All eagles, hawks, falcons and owls, including burrowing owls.)	0.09
Raptor species of special concern (Swainson's hawk, ferruginous hawk, peregrine falcon, golden eagle, bald eagle, burrowing owl and any federal threatened or endangered raptor species.)	0.06
Target grassland birds (All native bird species that rely on grassland habitat and are either resident species, occurring year round, or species that nest in the area, excluding horned lark, burrowing owl and northern harrier.)	0.59
State sensitive avian species listed under OAR 635-100-0040 (Excluding raptors listed above.)	0.20
Bat species as a group	2.50
Guyed Meteorological Tower Mortality	
Raptor T&E species and raptor species of special concern, as a group (Swainson's hawk, ferruginous hawk, golden eagle and burrowing owl; bald eagle, peregrine falcon, and any other federal threatened or endangered raptor species)	0.20/ guyed tower
Avian State Sensitive Species listed under OAR 635-100-0040 (Excluding raptors)	0.20/ guyed tower

Before the end of the first monitoring year, GHWF shall form a technical advisory committee (TAC) that will include at least GHWF, ODOE and ODFW. Other stakeholders, such as USFWS, may also serve on the TAC. The TAC shall consider the fatality monitoring results from Klondike III, Biglow Canyon, Nine Canyon, Leaning Juniper, Hopkins Ridge, Combine Hills, and other wind projects in Sherman County if available, and determine if the thresholds should be adjusted.

In addition, mitigation may be appropriate if fatality rates for individual species (especially State Sensitive Species) are higher than expected and at a level of biological concern. If the data show that a threshold of concern for a species group has been exceeded or that the fatality rate for any individual species is at a level of biological concern, mitigation shall be required if the Department determines that mitigation is appropriate based on analysis of the data

and any other significant information available at the time. If mitigation is appropriate, the certificate holder, in consultation with ODFW, shall propose mitigation measures designed to benefit the affected species. This may take into consideration whether mitigation required or provided for other impacts, such as raptor nesting or grassland bird displacement, would also benefit the affected species.

The certificate holder shall implement mitigation as approved by the Council. The Department may recommend additional, targeted data collection if the need for mitigation is unclear based on the information available at the time. The certificate holder shall implement such data collection as approved by the Council.

Mitigation shall be designed to benefit the affected species group. Mitigation may include, but is not limited to, protection of nesting habitat for the affected group of native species through a conservation easement or similar agreement. Tracts of land that are intact and functional for wildlife are preferable to degraded habitat areas. Preference should be given to protection of land that would otherwise be subject to development or use that would diminish the wildlife value of the land. In addition, mitigation measures might include: enhancement of the protected tract by weed removal and control; increasing the diversity of native grasses and forbs; planting sagebrush or other shrubs; constructing and maintaining artificial nest structures for raptors; reducing cattle grazing; improving wildfire response; and local research that would aid in understanding more about the species and conservation needs.

If the threshold for bats species as a group is exceeded, the certificate holder shall contribute to Bat Conservation International or to a Pacific Northwest bat conservation group ($10,000 per year for three years) to fund new or ongoing research in the Pacific Northwest to better understand impacts to the bat species impacted by the facility and to develop possible ways to reduce impacts to the affected species.

In addition, mitigation may be appropriate if fatality rates for a State Sensitive bat species listed under OAR 635-100-0040 are higher than expected and at a level of concern. If the data show that a threshold of concern for a species group has been exceeded or that the fatality rate for any individual species is at a level of concern, mitigation shall be required if the Department determines that mitigation is appropriate based on analysis of the data and any other significant information available at the time. If mitigation is appropriate, the certificate holder, in consultation with ODFW, shall propose mitigation measures designed to benefit the affected species. The certificate holder shall implement mitigation as approved by the Council.

2. Raptor Nest Surveys

The objectives of raptor nest surveys are to estimate the size of the local breeding populations of tree or other above-ground-nesting raptor species in the vicinity of the facility and to determine whether operation of the facility results in a reduction of nesting activity or nesting success in the local populations of the following raptor species: Swainson's hawk, ferruginous hawk and golden eagle. The certificate holder shall direct a qualified biologist, approved by the Department, to conduct the raptor nest surveys. The certificate holder may select other qualified biologists to conduct the raptor nest surveys, subject to Department approval.

(a) Survey Protocol

For the species listed above, aerial and ground surveys will be used to gather nest success data on active nests, nests with young and young fledged. The certificate holder will share the

data with state and federal biologists. The certificate holder shall conduct two years of post-construction raptor nest surveys for the completed facility during the sensitive nesting and breeding season. One year of post-construction surveys will be done in the first nesting season after construction is completed. The second year of post-construction surveys will be done at a time recommended by the certificate holder and approved by the Department. The certificate holder may collaborate with other certificate holders in the vicinity of the facility in the development of useful information about future impacts on raptor nesting activity and nesting success.

Prior to the raptor nesting surveys, the certificate holder shall review the locations of known raptor nests based on the GHWF, the Biglow Canyon Wind Farm and Klondike Wind Project pre-construction surveys as well as any nest survey data collected after construction. All known nest sites and any new nests observed within the GCWF site and within two miles of the GHWF site will be given identification numbers. Nest locations will be recorded on U.S. Geological Survey 7.5-minute quadrangle maps. Global positioning system coordinates will be recorded for each nest and integrated with the baseline database. Locations of inactive nests will also be recorded as they may become occupied during future years.

During each raptor nesting monitoring year, the certificate holder shall conduct a minimum of one helicopter survey in late May or early June within the GHWF site and a 2-mile zone around the turbines to determine nest occupancy. Determining nest occupancy will likely require two visits to each nest: The second visit may be done by air or by ground as appropriate. For occupied nests of the species identified above, the certificate holder shall determine nesting success by a minimum of one ground visit to determine species, number of young and nesting success. "Nesting success" means that the young have successfully fledged (the young are independent of the core nest site). Nests that cannot be monitored due to the landowner denying access will be checked from a distance where feasible.

(b) Mitigation

The certificate holder shall analyze the raptor nesting data collected after two monitoring years to determine whether a reduction in either nesting success or nest use has occurred in the vicinity of the GHWF. If the analysis indicates a reduction in nesting success by Swainson's hawk, ferruginous hawk or golden eagle within two miles of the facility (including the area within the GHWF site), then the certificate holder shall propose appropriate mitigation and shall implement mitigation as approved by the Council. At a minimum, if the analysis shows that any of these species has abandoned a nest territory within the facility site or within ½ mile of the facility site, or has not fledged any young over the two survey years within the facility site or within ½ mile of the facility site, the certificate holder shall assume the abandonment or unsuccessful fledging is the result of the facility unless another cause can be demonstrated convincingly. If the GHWF facility and the Klondike III facility are both required to provide mitigation for the same nest, the two certificate holders shall coordinate the required mitigation with the approval of the Department.

Given the very low buteo nesting densities in the area, statistical power to detect a relationship between distance from a wind turbine and nesting parameters (*e.g.*, number of fledglings per reproductive pair) will be very low. Therefore, impacts may have to be judged based on trends in the data, results from other wind energy facility monitoring studies and literature on what is known regarding the populations in the region.

If the analysis shows that mitigation is appropriate, the certificate holder shall propose mitigation for the affected species in consultation with the Department and ODFW, and shall implement mitigation as approved by the Council. Mitigation should be designed to benefit the affected species or contribute to overall scientific knowledge and understanding of what causes nest abandonment or nest failure. Mitigation may be designed to proceed in phases over several years. It may include, but is not limited to, additional raptor nest monitoring, protection of natural nest sites from human disturbance or cattle activity (preferably within the general area of the facility), or participation in research projects designed to improve scientific understanding of the needs of the affected species. Mitigation may take into consideration whether mitigation required or provided for other impacts, such as fatality impacts or grassland bird displacement, would also benefit the raptor species whose nesting success was adversely affected.

(c) Long-term Raptor Nest Monitoring and Mitigation

In addition to the two years of post-construction raptor nest surveys described in subsection (a), GHWF shall conduct long-term raptor nest surveys at five year intervals for the life of the facility. GHWF shall conduct the first long-term raptor nest survey in the ninth year after construction is completed. In conducting long-term surveys, GHWF shall follow the same survey protocols as described above in subsection (a)unless GHWF proposes an alternative protocol that is approved by the Department. In developing an alternative protocol, GHWF shall consult with ODFW.

GHWF shall analyze the raptor nesting data collected after each year of long-term raptor nest surveys to determine whether a reduction in either nesting success or next use has occurred in the vicinity of the GHWF. If the analysis indicates a reduction in nesting success or nest use by Swainson's hawks, golden eagles, or ferruginous hawks within the facility site or within 2 miles of the site, then GHWF shall propose appropriate mitigation for the affected species as described in subsection (b) and shall implement mitigation as approved by the Council. At a minimum, if the analysis shows that any raptors of these species have abandoned a nest territory within the facility site or within ½ mile of the facility site or has not fledged any young within that same area, GHWF shall assume the abandonment or unsuccessful fledging is due to operation of the facility unless another cause can be demonstrated convincingly.

Any reduction in nesting success or nest use could be due to operation of the GHWF facility, operation of another wind facility in the vicinity or some other cause. GHWF shall attribute the reduction to operation of GHWF if the wind turbine closest to the affected nest site is a GHWF turbine unless GHWF demonstrates, and the Department agrees, that the reduction was due to a different cause.

Given the low raptor nesting densities in the area, statistical power to detect a relationship between distance from a wind turbine and nesting parameters (e.g. number of fledglings per reproductive pair) will be very low. Therefore, impacts may have to be judged based on trends in the data, results from other wind energy facility monitoring studies and literature on what is known regarding the population in the region.

3. Avian Use and Behavior Surveys

Searchers will also record bird species observed and their behavior relative to turbine locations before or after each standardized carcass search (as described in Section 1(e) above). Observations will be recorded during 5-minute surveys at each turbine sampled during the fatality monitoring program, using standard variable circular plot point count survey methods. Collection and recording of these additional observations of live birds will be carried out in a manner that does not distract searchers from carrying out the standardized carcass searches.

All of these avian use and behavior data, as well as raptor and waterfowl mortality observed at the turbines near these stations, will be used to understand direct and indirect impacts of the GHWF facility on raptors, waterfowl and other avian species. The certificate holder shall include an analysis of this data in the reports described in Section 5.

4. GHWF Wildlife Incident Response and Handling System

The Wildlife Incident Response and Handling System is a monitoring program set up for responding to and handling avian and bat casualties found by construction and maintenance personnel during construction and operation of the facility. This monitoring program includes the initial response, the handling and the reporting of bird and bat carcasses discovered incidental to construction and maintenance operations ("incidental finds"). Construction and maintenance personnel will be trained in the methods needed to carry out this program.

All carcasses discovered by construction or maintenance personnel will be photographed, recorded and collected.

If construction or maintenance personnel find carcasses within the plots for protocol searches, they will notify a qualified biologist, as approved by the Department, who will collect the carcasses. The fatality data will be included in the calculation of fatality rates.

If construction or maintenance personnel discover incidental finds that are not within plots for fatality monitoring protocol searches, they will notify a qualified biologist, as approved by the Department, and the carcass will be collected by a carcass-handling permittee (a person who is listed on state and federal scientific or salvage collection permits). Data for these incidental finds will be reported separately from standardized fatality monitoring data.

The certificate holder shall coordinate collection of state endangered, threatened, sensitive or other state protected species with ODFW. The certificate holder shall coordinate collection of federally-listed endangered or threatened species and Migratory Bird Treaty Act protected avian species with the USFWS.

5. Data Reporting

The certificate holder will report the monitoring data and analysis to the Department. Monitoring data include fatality monitoring program data, raptor nest survey data, avian use and behavior survey data and data on incidental finds by fatality searchers and GHWF personnel. The report may be included in the annual report required under OAR 345-026-0080 or may be submitted as a separate document at the same time the annual report is submitted. In addition, the certificate holder shall provide to the Department any data or record generated in carrying out this monitoring plan upon request by the Department.

The certificate holder shall immediately notify USFWS and ODFW, respectively, in the event that any federal or state endangered or threatened species are killed or injured on the facility site.

The public will have an opportunity to receive information about monitoring results and to offer comment. Within 30 days after receiving the annual report of monitoring results, the Department will make the report available to the public on its website and will specify a time in which the public may submit comments to the Department.[6]

6. Amendment of the Plan

This Wildlife Monitoring and Mitigation Plan may be amended from time to time by agreement of the certificate holder and the Council. Such amendments may be made without amendment of the site certificate. The Council authorizes the Department to agree to amendments to this plan and to mitigation actions that may be required under this plan. The Department shall notify the Council of all amendments and mitigation actions, and the Council retains the authority to approve, reject or modify any amendment of this plan or mitigation action agreed to by the Department.

[6] The certificate holder may establish a Technical Advisor Committee (TAC) but is not required to do so. If the certificate holder establishes a TAC, the TAC may offer comments to the Council about the results of the monitoring required under this plan.

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE:	May 2008
TO:	Kelly O'Brien, BP Alternative Energy
FROM:	Sean Sullivan, L.A.
SUBJECT:	**Addendum to Exhibit R**
PROJECT:	Golden Hills Wind Farm
PROJECT NO:	BPOC0000-0005
COPIES:	file

Golden Hills Wind Farm LLC (Applicant) proposes to revise turbine corridors and turbine types for the Golden Hills Wind Farm. This memo summarizes potential impacts to Scenic and Aesthetic Values identified in the analysis area defined in Exhibit R. DEA used the same means and methods to determine potential impacts to Scenic and Aesthetic Values as used in the application.

Loss of Vegetation or Alteration of the Landscape

The proposed changes may impact several trees, which are an important feature in the Sherman County landscape. If this occurs, appropriate mitigation as described in Exhibit P would be provided. The proposed changes would not substantially alter other impacts to the landscape. Therefore, changes in impacts would be negligible, if any.

Visual Impacts of Facility Structures or Plumes

A visibility analysis of the proposed changes was conducted for the analysis area defined in Exhibit R and is attached as Figure R-1. Yellow shading indicates areas from which any portion of any turbine or transmission line would be visible, as predicted by the computer models. Blue shading indicates those areas from which the project would no longer be visible as defined by the Addendum and predicted by the models. Blue areas are insignificant and occur only in the vicinity of the easternmost turbine string.

The project as defined by the Addendum would result in minimal changes in impacts, if any, to scenic and aesthetic resources identified in the analysis area. Impacts to the Columbia River Gorge National Scenic Area (CRGNSA) would remain practically the same. Modeling results indicate the project would remain not visible from Oregon National Historic Trail High Potential Sites (i.e., Deschutes River Crossing, Biggs Junction, and John Day River Crossing [aka McDonald Ferry]). Changes in visibility from the Lower Deschutes Canyon and John Day River Canyon would be practically negligible and only occur along isolated canyon rims. Turbine strings along the Journey Through Time Scenic Byway would be moved in the project per the Addendum, so the aspect and duration of view for individual turbines may change, but the relative degree of visibility and impact would be essentially the same in the addendum configuration as in the application. As described above, the

proposed changes may impact several trees, which are an important feature in the Sherman County landscape. If this occurs, appropriate mitigation as described in Exhibit P would be provided.

Conclusion

Given these considerations, the design, construction, operation, and retirement of the proposed facility per the addendum would not significantly affect significant or important scenic and aesthetic resources in the analysis area.

Golden Hills Wind Project
Addendum to Exhibit R

FIGURE R-1

Visibility Analysis

KLICKITAT COUNTY

GILLIAM COUNTY

SHERMAN COUNTY

WASCO COUNTY

Biggs Junction

Deschutes River Crossing

John Day River Crossing (McDonald Ferry)

MORO

GRASS VALLEY

The Dalles

John Day River

Deschutes River

- Site-Specific Scenic Resource
- Transmission Line
- Journey Through Time Scenic Byway (US 97)
- Columbia River Gorge National Scenic Area
- Federal Wild and Scenic River
- Area of High Visual Quality (BLM, Prineville Dist.)
- Additional Addendum Corridor
- Removed Addendum Corridor
- Application Corridor
- Scenic and Aesthetic Value Analysis Area
- County Boundary
- Addendum Turbines Visible
- Application Turbines Visible

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EXHIBIT S

HISTORIC, CULTURAL, AND ARCHAEOLOGICAL RESOURCES

OAR 345-021-0010(1)(s)

TABLE OF CONTENTS

ATTACHMENTS

S.1 INTRODUCTION

OAR 345-021-0010(1)(s) Information about historic, cultural, and archaeological resources providing evidence to support a finding by the Council as required by OAR 345-022-0090, including:

Response: This exhibit describes impacts related to the Golden Hills Wind Energy Development (the Project) on historic, cultural, and archaeological resources in the vicinity. For discussions of Exhibit S, the "analysis area" for archaeology is synonymous with the Area of Potential Effects (APE) from ground disturbances related to Project construction, operation, and retirement of the facility. The total APE for archaeology is approximately 7,101 acres, including turbine corridors (Corridors A to Q), crane paths, underground collector lines, existing road improvements, new roads, transmission lines, bridge improvement, laydown areas, and substations.

S.2 HISTORIC AND CULTURAL RESOURCES LISTED, OR POSSIBLY ELIGIBILE FOR LISTING, ON THE NATIONAL REGISTER OF HISTORIC PLACES

(A) Historic and cultural resources within the analysis area that have been listed, or would likely be eligible for listing, on the National Register of Historic Places;

Response: "Historic properties" are cultural resources that have been listed on, or determined to be eligible for listing on, the National Register of Historic Places (NRHP). The Oregon State Historic Preservation Office (OSHPO) maintains files concerning NRHP-listed sites and determinations of eligibility. At present, one historic property, DeMoss Springs Park, is listed on the NRHP. Since 2007, a proposed underground collector line for the Project was redesigned and relocated approximately 500 feet south of DeMoss Springs Park to avoid potential impacts to associated archaeological sites.

In addition, the Project crosses portions of the Oregon Trail and the Barlow Cutoff, which are known to be associated with events that have made a significant contribution to the broad patterns of our history (36 CFR 60.4, criterion "a"), and are potentially eligible for the NRHP. The Oregon Trail is designated as an Historic Trail under both federal and Oregon statutes. Historic-period maps from the General Land Office; the 1913 Atlas of Sherman County, Oregon; 1959 Oregon State Highway Department maps; and highway historic markers identified the Oregon Trail in varying locations, including crossing portions of Corridors O and P (Attachment S-1; Figure 2).

Apart from two historic-period isolated finds (GH Iso 3 and GH Iso 5) located near the presumed Oregon Trail in Corridor O, no physical evidence of the trail was observed at any of the Project crossings. Excavation of up to eight shovel probes around each isolated find recovered no additional artifacts and no stratigraphic evidence for the Oregon Trail. Farming activity is likely to have obliterated most—if not all—physical traces of the trail.

This same physical disturbance makes it difficult to substantively correlate the isolated finds to that of the historic emigrant route.

The Oregon Trail Cut-off to the Barlow Road begins at the John Day River Oregon Trail Crossing east of Wasco and runs southwesterly to Grass Valley and from Grass Valley southwesterly on Highway 216 to Hollenbeck Point where emigrants entered Buck Hollow and the Deschutes River crossing north of present-day Sherar's Bridge. This historic emigrant route crossed the APE in the southeastern portion of the Project within turbine Corridor D and associated underground collector routes and crane paths. Complete archaeological pedestrian surveys were conducted at each of the above-mentioned trail crossings. No physical evidence of the Barlow Cutoff Route was observed at any of these locations. Farming activity seems to have obliterated most—if not all—physical traces of the trail. This same physical disturbance makes it difficult to substantively correlate the isolated finds to that of the historic emigrant route.

S.3 ARCHAEOLOGICAL OBJECTS AND SITES ON PRIVATE LANDS WITHIN THE ANALYSIS AREA

(B) For private lands, archaeological objects, as defined in ORS 358.905(1)(a), and archaeological sites, as defined in ORS 358.905(1)(c), within the analysis area;

Response: The OSHPO maintains archaeological records of archaeological sites, "isolated finds" (including nine or fewer artifacts), and aboveground resources (archaeological and architectural sites) within the state. Site file research at OSHPO identified no archaeological sites, isolated finds, or aboveground resources recorded within the Project APE.

S.4 ARCHAEOLOGICAL OBJECTS AND SITES ON PUBLIC LANDS WITHIN THE ANALYSIS AREA

(C) For public lands, archaeological sites, as defined in ORS 358.905 (1)(c) , within the analysis area;

Response: There are no public lands in the Project APE.

S.5 SIGNIFICANT POTENTIAL IMPACTS OF CONSTRUCTION, OPERATION, AND RETIREMENT OF THE FACILITY ON HISTORIC, CULTURAL, AND ARCHAEOLOGICAL RESOURCES

(D) The significant potential impacts, if any, of the construction, operation, and retirement of the proposed facility on the resources described in paragraphs (A), (B), and (C) and a plan for protection of those resources that includes at least the following:

S.5.1 Methodology

(i) A description of any discovery measures, such as surveys, inventories, and limited subsurface testing work, recommended by the State Historic Preservation Officer and the National Park Service of the U.S. Department of Interior for the purpose of locating, identifying, and assessing the significance of resources listed in paragraphs (A), (B), and (C);

Response: Archival research was conducted at the OSHPO in Salem to review archaeological site records and reports, and properties listed on the NRHP. Additional background literature research was conducted at the Sherman County Historical Society and Museum in Moro, at the Dalles-Wasco County Library in the City of The Dalles, and at the Oregon Historical Society in Portland, Oregon. Consultation was also undertaken with Native American groups including the Confederated Tribes of the Warm Springs Reservation, the Confederated Tribes and Bands of the Yakama Indian Nation, the Colville Confederated Tribes, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce Tribe. Copies of letters initiating consultations with Native American tribes are provided in Attachment S-1. No responses from Native American tribes have been received at this time. Following recommendations by OSHPO, a telephone consultation was conducted with the Umatilla Tribe Archaeologist about the environmental settings of stacked rock features, including both prehistoric-period and historic-period cultural resources (Attachment S-2).

Archaeological field investigations were conducted during May and June 2007 and during April 2008. The archaeological field investigations were conducted in compliance with professional standards and guidelines of the OSHPO (OSHPO 2006, 2007). During the 2007 field investigation, a pedestrian survey was conducted in areas with good ground visibility in order to identify surface artifacts and aboveground features associated with prehistoric-period and historic-period archaeological sites and aboveground historic-period sites. Portions of the Project APE were planted in crops and were not surveyed due to poor ground visibility. In portions of the APE where surface visibility was deemed adequate, surface survey was performed by three to six archaeologists walking transects spaced no greater than 25 meters. During the field survey, all archaeological sites, isolated finds, and historic structures identified within the Project APE were documented and mapped using a Trimble GeoXT global positioning system (GPS) unit. Photographs were taken of all cultural resource settings and intermittently throughout the survey area to document landforms, vegetation coverage, and identified disturbances. No subsurface testing or collection of artifacts was conducted at any sites, localities, or isolated finds during the 2007 field investigation. Approximately 54 percent of the Project APE (3,810 acres) was surveyed during the 2007 field investigation. All archaeological sites, archaeological isolated finds, and aboveground resources identified during the 2007 field investigation were recommended for avoidance during Project construction.

Following the 2007 field investigation, OSHPO recommended development of a sensitivity model for non-surveyed portions of the APE, including new areas resulting from redesigns

of the APE. As a result of sensitivity modeling and following OSHPO recommendations, approximately 1,011 acres were identified for supplemental archaeological field investigations during 2008. The 2008 supplemental pedestrian survey followed methods utilized during 2007 and OSHPO guidelines (2006, 2007). All areas recommended for survey in the 2008 sensitivity model and by OSHPO were investigated during the 2007 and 2008 field investigations.

Following the 2007 field investigation, five cultural resources (one prehistoric-period archaeological site, one historic-period archaeological site, and three historic-period aboveground resources) were avoided by redesigns of the Project APE. Other archaeological sites and isolated finds were investigated in detail during the 2008 field investigation to document site boundaries and develop avoidance plans during construction. Intensive surface surveys were conducted at three historic-period archaeological sites, and site boundaries were recorded by GPS surveys.

In accordance with OSHPO guidelines, shovel probes were utilized to determine whether six isolated finds in the Project APE were associated with buried archaeological sites. At prehistoric-period site GH Site 1, shovel testing was conducted beyond the site boundary to verify that buried remains were not present and to document areas outside of identified site boundaries. Shovel probes were excavated at 5-meter (16-foot) intervals. The location of each shovel probe was recorded with a GPS unit. Shovel probes measured 30 centimeters (1 foot) in diameter, and were excavated in arbitrary 20-centimeter levels to depths of 60 centimeters below surface (cmbs) or deeper, unless impeded by an impasse (e.g., excessively rocky soils, hard pan, impenetrable soil compactions, etc.). Excavated soils were screened through 0.25-inch mesh on shaker screens. Field forms recorded soil strata depths, Munsell soil color, soil texture, rocks, gravel, and other inclusions. No historic-period or prehistoric-period artifacts were identified in shovel tests. At isolated finds, two shovel probes were excavated at each cardinal direction (eight total shovel probes) around the find location. Fewer shovel probes were dug around isolated finds adjacent to disturbances and steep stream banks.

S.5.2 Survey and Inventory Results

(ii) The results of surveys, inventories, and subsurface testing work recommended by the state and federal agencies listed in subparagraph (i), together with an explanation by the applicant of any variations from the survey, inventory, or testing recommended

Response: In total, 4,821 acres of the APE were surveyed during 2007 and 2008 for the presence of archaeological sites, isolated finds, and aboveground resources. As a result of these pedestrian surveys, 16 cultural resources were identified, including 2 prehistoric-period archaeological sites, 4 historic-period archaeological sites, 2 prehistoric-period archaeological isolated finds, 4 historic-period archaeological isolated finds, and 4 historic-period aboveground sites. Each of these resources is discussed in Attachments S-1 and S-2, and full

Oregon State Archaeological and Aboveground Resource Inventory forms were prepared for OSHPO.

GH Site 1 is a prehistoric-period lithic scatter located along the transmission line north of Corridor C. The site is located on a rocky southwest-facing ridge slope overlooking an intermittent drainage ravine. The site measures approximately 256 meters (840 feet) north-south by 67 meters (220 feet) east-west, or about 13,500 square meters (3.3 acres) in area. Surface survey identified the limits of the artifacts, consisting entirely of chert debitage, on the site surface. Shovel probes were excavated at 5 meters and 10 meters north of the surface scatter to verify that buried artifacts did not extend onto the ridge crest. In total, 18 shovel probes were excavated north of the site and no cultural materials were recovered. Shovel probe locations were recorded by GPS and provide detailed information for OSHPO and Project engineers to avoid the site during Project construction.

GH Site 2 is an historic-period farm dump located during the 2007 field investigation. The site is in a laydown area west of Corridor A. Artifacts include agricultural items, machinery, and domestic refuse. The site extends for 87 meters (285 feet) north-south and 30 meters (98 feet) east-west and covers approximately 2,200 square meters (0.5 acre). During 2008, Tetra Tech EC, Inc. (TtEC) performed intensive surface surveys of surrounding fields to verify site boundaries. No shovel probes were excavated, since extant surface artifacts and grassy vegetation established the site boundaries accurately. Site boundaries were delineated by GPS readings. Accurate GPS data will facilitate site avoidance during Project construction.

GH Site 3 is an historic-period farmstead identified during the 2007 field investigation. The site is in a proposed equipment laydown area west of Corridor A. The site is indicated by lines of locust trees, two vaulted cellar features, farm equipment, and other items. The site is approximately 275 meters (902 feet) in length from northeast to southwest, 110 meters (361 feet) in width, and 23,315 square meters (5.8 acres) in area. During the 2008 field investigations, intensive surface surveys were performed in surrounding areas. Site boundaries were based on vegetation, major artifacts, and other landscape features. No shovel probes were excavated, as extant features established the site boundaries adequately. Site boundaries were delineated by GPS readings. Accurate GPS data will facilitate site avoidance during Project construction.

GH Site 4 is an historic-period aboveground resource, including a windmill, stone retaining wall, and abandoned dirt road, identified during the 2007 field investigation. After the 2007 field investigation, the Project APE was redesigned to avoid Project impacts to this site.

GH Site 5 is an historic-period archaeological site near DeMoss Springs identified during the 2007 field investigation. The site includes portions of a stone and concrete foundation, an adjoining underground tank structure, and a concrete cistern. After the 2007 field investigation, the Project APE was redesigned to avoid Project impacts to this site.

GH Site 6 is an historic-period aboveground resource, including transmission line poles, identified during the 2007 field investigation. After the 2007 field investigation, the Project APE was redesigned to avoid Project impacts to this site.

GH Site 7 is a prehistoric-period archaeological site identified during the 2007 field investigation. The site contains chert flakes and debitage east of Spanish Hollow. After the 2007 field investigation, the Project APE was redesigned to avoid Project impacts to this site.

GH Site 8 is an historic-period aboveground resource along the proposed transmission line southwest of the John Day Substation. The resource consists of three wooden poles with glass insulators along a fence line south of Tom Road. The site was recommended as not eligible for the NRHP, based on lack of architectural integrity and distinctive characteristics.

GH Site 9 is an historic-period farmstead located south of a crane path east of Corridor G and identified during the 2008 field investigation. The site was identified by a circular formation of locust trees that formerly served as shade and windbreaks for a house and perhaps a barn. The trees surround grassy mounds, partially collapsed and buried stone walls, and other features and artifacts. The site measures approximately 70 meters (230 feet) north to south and 40 meters (132 feet) east-west, or about 2,800 square meters (0.7 acres) in area. No shovel probes were excavated. GPS points of historic-period landscape features established the site boundaries.

GH Iso 6 is an historic-period aboveground resource, consisting of a standing windmill, located near Corridor O. This structure was identified during the 2007 field investigation. After the 2007 field investigation, the Project APE was redesigned to avoid Project impacts to this site.

GH Iso 1 is an historic-period Oregon license plate identified during the 2007 field investigation. During the 2008 field investigation, eight shovel probes encountered no additional artifacts or stratigraphic evidence to indicate a buried archaeological site.

GH Iso 2 is a scatter of nine historic-period artifacts in Corridor I identified during the 2007 field investigation. During the 2008 field investigation, eight shovel probes encountered no additional artifacts or stratigraphic evidence to indicate a buried archaeological site.

GH Iso 3 is an historic-period whiteware sherd in Corridor O identified during the 2007 field investigation. The sherd is near a mapped location of the Oregon Trail. During the 2008 field investigation, eight shovel probes encountered no additional artifacts to indicate a buried archaeological site. No stratigraphic evidence was observed in shovel probe profiles to indicate the location of the Oregon Trail.

GH Iso 4 is a prehistoric-period chert flake located along the transmission line east of Spanish Hollow identified during the 2007 field investigation. During the 2008 field

investigation, four shovel probes encountered no additional artifacts or stratigraphic evidence to indicate a buried archaeological site.

GH Iso 5 is an historic-period rusted tin object in Corridor O identified during the 2007 field investigation. The artifact is near a mapped location of the Oregon Trail. During the 2008 field investigation, eight shovel probes encountered no additional artifacts to indicate a buried archaeological site. No stratigraphic evidence was observed in shovel probe profiles to indicate the location of the Oregon Trail.

GH Iso 7 is a prehistoric-period chert flake identified during the 2007 field investigation along the transmission line south of Tom Road. During the 2008 field investigation, eight shovel probes encountered no additional artifacts or stratigraphic evidence to indicate a buried archaeological site.

S.5.3 Measures Designed to Prevent Destruction of Historic, Cultural, and Archaeological Resources

(iii) A list of measures to prevent destruction of the resources identified during surveys, inventories, and subsurface testing referred to in subparagraph (i) or discovered during construction; and

Response: Cultural resources might be affected during Project construction by ground disturbances related to machine activities. In total, 16 cultural resources were identified during the 2007 and 2008 field investigations. Following the 2007 field investigations, the Project APE was modified to avoid impacts to five cultural resources (GH Site 4, GH Site 5, GH Site 6, GH Site 7, and GH Iso 6).

During the 2008 field investigation, shovel probes were excavated at six isolated finds. Shovel probes demonstrated that buried archaeological sites were not present at these locations. TtEC recommends that isolated finds are not to be considered significant cultural resources. Similarly, GH Site 8 was an historic-period aboveground resource along a transmission line that was recommended as not eligible for the NRHP. As such, TtEC recommends that these locations do not need to be avoided during Project construction. OSHPO concurrence will be requested.

Four archaeological sites were documented within the Project APE, including prehistoric-period site GH Site 1 and historic-period sites GH Site 2, GH Site 3, and GH Site 9. Detailed investigations were conducted to document the boundaries of each of these sites. All of the archaeological sites are recommended for avoidance during construction, operation, and retirement of the proposed facilities.

Intensive investigations were conducted to document that isolated finds within the Project APE were not associated with buried archaeological sites. No evidence was identified for the Oregon Trail, the Barlow Cutoff, or other historic trails. Shovel probing was conducted at isolated finds GH Iso 3 and GH Iso 5 near mapped locations of the Oregon Trail; however, no additional artifacts or stratigraphic evidence for the trail was identified.

A Cultural Resource Management Plan (CRMP) will be developed by the Applicant in coordination with the OSHPO. Archaeological sites will be protected by 30-meter (100-foot) "no access" buffers. These "no access" buffers will be identified on construction plans and temporarily demarcated in the field before and during construction. The Project Environmental Inspector will monitor flagged "no access" buffers around archaeological sites during construction to prevent accidental damage to cultural resources. OSHPO concurrence will be requested.

As a result of the 2007 and 2008 Phase 1B field investigations, TtEC recommends no additional cultural resource field investigations for this Project.

S.5.4 Permit Application

(iv) A completed copy of any permit applications submitted pursuant to ORS 358.920. Notwithstanding OAR 345-021-0000(4), the applicant shall include copies of the permit applications as part of the site certificate application. If the same information required by subparagraphs (i) through (iii) above is contained in the permit applications, then the applicant may provide cross-references to the relevant sections of the permit applications in substitution.

Response: No permit applications have been submitted to the OSHPO pursuant to ORS 358.920 because no subsurface testing on public or private land was conducted within recorded sites. In the event that heretofore undiscovered archaeological sites are inadvertently disturbed during construction, construction work will cease and the Applicant will direct its archaeologist to apply for necessary archaeological excavation permits from the OSHPO. This requirement will be included in the CRMP.

S.6 PROPOSED MONITORING PROGRAM

(E) The applicant's proposed monitoring program, if any, for impacts to historic, cultural, and archaeological resources during construction, operation and retirement of the proposed facility;

Response: During construction in archaeologically sensitive locations, such as near recorded archaeological sites, on-site archaeological monitors will be present to ensure that no accidental damage to known cultural resources occurs, if required by OSHPO. The CRMP will address long-term management of the known/recorded resources and will include a section on accidental discovery of cultural resources. This section will provide a detailed plan of protocols and procedures (measures) to be followed if cultural resources are accidentally discovered during construction or operation of the facilities.

S.7 REFERENCES

OSHPO 2006. Oregon State Historic Preservation Office Standards for Conducting Cultural Resources Inventories. Salem, Oregon.

OSHPO 2007. Guidelines for Conducting Field Archeology in Oregon. Salem, Oregon.

ATTACHMENT S-1

Archaeological Inventory for the Golden Hills Wind Energy Development, Sherman County, Oregon

ATTACHMENT S-2

Supplemental Phase 1B Archaeological Investigations for the Golden Hills Wind Energy Development, Sherman County, Oregon

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE:	May 2008
TO:	Kelly O'Brien, BP Alternative Energy
FROM:	Sean Sullivan, L.A.
SUBJECT:	**Addendum to Exhibit T**
PROJECT:	Golden Hills Wind Farm
PROJECT NO:	BPOC0000-0005
COPIES:	file

Golden Hills Wind Farm LLC (Applicant) proposes to revise turbine corridors and turbine types for the Golden Hills Wind Farm. This memo summarizes changes in potential impacts to important recreational facilities and opportunities identified in the analysis area defined in Exhibit T. DEA used the same means and methods to determine potential impacts to important recreational facilities and opportunities as used in the application.

Direct or Indirect Loss of Opportunity

The changes proposed in the Addendum would not occur within the boundaries of, nor impede access to any of the important recreational facilities or opportunities identified in the analysis area. Therefore, the proposed changes would not affect the direct or indirect loss of an important recreational facility or opportunity.

Noise Resulting from Facility Construction or Operation

The noise analysis for the application indicated the proposed project may be audible from the Journey Through Time Scenic Byway, Oregon National Historic Trail, and DeMoss Springs Memorial Park. The proposed changes would not likely affect the impacts to the byway or trail, which were determined to be negligible, if any, in the application.

The proposed changes may affect noise impacts at DeMoss Springs Memorial Park. The noise analysis conducted for the application indicates the maximum noise level at the park would be approximately 48 dBA, just below the Oregon Department of Environmental Quality (ODEQ) threshold of 50 dBA. The noise analysis for the proposed changes indicates a maximum noise level at the park would be slightly lower at approximately 47 dBA, still within the ODEQ threshold. Therefore, noise impacts to DeMoss Springs Memorial Park would be slightly less, but practically negligible.

Increased Traffic Resulting from Facility Construction or Operation

The proposed changes would not affect traffic resulting from facility construction or operation because its overall size and construction routes would not change. Therefore, there would be no changes in traffic impacts.

Visual Impacts of Facility Structures or Plumes

A visibility analysis was conducted and discussed in more detail in a memorandum specific to Exhibit R. In general, though, the proposed project per the addendum would be slightly less visible only in the immediate vicinity of the easternmost turbine string in areas with minimal accessibility (canyon bottoms). The relative change in visibility from important recreational facilities and opportunities is negligible.

Conclusion

Given these considerations, the design, construction, operation, and retirement of the proposed facility per the addendum would not significantly affect important recreational facilities and opportunities in the analysis area.

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: May 2008

TO: Kelly O'Brien, BP Alternative Energy

FROM: Dana Siegfried

SUBJECT: **Addendum to Exhibit W**

PROJECT: Golden Hills Wind Farm

PROJECT NO: BPOC0000-0005

COPIES: file

Golden Hills Wind Farm LLC (Applicant) has indicated that they will accept the $13,685,000 retirement costs calculated by ODOE and/or their consultant, provided that Applicant will only post security in proportion to extent of the facility that actually is built. The applicant provides the following information in response to questions posed in a letter from the ODOE dated October 8, 2007. The excerpted requested additional information items from ODOE are italicized, and BPAE's responses to each request are below.

Exhibit B, page B-1. Provide a table describing all possible turbine types that may be installed at the proposed facility, including the following specifications:

- *Manufacturer*
- *Model*
- *Peak generating capacity (MW)*
- *Hub height (meters)*
- *Rotor diameter (meters)*
- *Guaranteed maximum sound power Level (dBA)*
- *Sound power level uncertainty band*
- *Weight of metals in tower (US tons)*
- *Weight of metals in nacelle (US tons)*

	Option 1	**Option 2**
Manufacturer	GE	Clipper
Model	sle 1.5	C-96
Peak Generating Capacity (MW)	1.5	2.5
Hub Height (meters)	80	80
Rotor diameter (meters)	77	96
Guaranteed maximum sound level (dBA)	106	107
Sound power level uncertainty band (dBA)	+/- 2	+/- 2
Weight of metals in tower (US tons)	138.1	208.5
Weight of metals in nacelle (US tons)	117.9	113.5

Exhibit B, page B-2. *For each possible turbine type, describe the configuration of the turbine foundation and the amount of concrete in the turbine foundation above ground level and to a depth of 3 feet below ground level.*

For both the GE and Clipper turbines the proposed foundations are a spread footing "inverted T" gravity foundation similar to the foundations on projects in the area. The proposed Clipper foundation will have 4.7 cubic yards of concrete above ground and 28.3 cubic yards of concrete to a depth 3 feet below ground level. The proposed GE foundation will have 4.5 cubic yards of concrete above ground and 26.7 cubic yards of concrete to a depth 3 feet below ground level.

Exhibit B, page B-2. *Describe the configuration of the transformer foundations and the amount of concrete in the transformer foundations above ground level and to a depth of 3 feet below ground level.*

The proposed Clipper pad mounted transformer foundation will have 2.8 cubic yards of concrete above ground and 14.6 cubic yards of concrete to a depth 3 feet below ground level. The proposed GE pad mounted transformer foundation will have 1.4 cubic yards of concrete above ground and 7.3 cubic yards of concrete to a depth 3 feet below ground level. The reason for the relatively large quantity discrepancy between the two foundations is due to the fact that the Clipper turbine will have additional equipment next the pad mounted transformer that sits on the same foundation.

Exhibit B, page B-3. *Describe the distance from the transformer to the base of the turbine tower.*

In the proposed Clipper configuration of the pad mounted transformer there is a distance of approximately 3 feet to the edge of the tower foundation. In the proposed GE configuration of the pad mounted transformer there is a distance of approximately 5 feet to the edge of the tower foundation.

Exhibit B, page B-3. *Describe the size and total number of turnaround areas that would be constructed at the ends of turbine strings.*

Any turnarounds that are constructed would be for temporary use during construction and would be removed at the end of construction. It is expected that there could be 20 turnaround areas required for the build out of the entire project as permitted. Each turnaround area would cover an area of roughly 0.4 acres.

Exhibit B, page B-3. *Describe the configuration of the meteorological tower foundations and the amount of concrete in the foundations above ground level and to a depth of 3 feet below ground level.*

The foundations for the permanent meteorlogical foundations will be comprised of four 3 foot diameter sonotubes. For each met tower there will be a total of 0.5 cubic yards of concrete above ground and a total of 3.1 cubic yards of concrete to a depth of 3 feet below ground level (the total refers to the sum of the concrete in all four sonotubes).

Exhibit B, page B-4. *Describe the maximum distance over which the 34.5-kV power collection system would be installed above ground.*

At this time the proposed facility does not plan to make use of above ground 34.5-kV power collection systems.

Exhibit B, pages B-3 and B-4*. Describe the total number of wires and SCADA fiber optic cables that would be installed on the aboveground segments of the 34.5-k.V power collection system.*

As mentioned above, at this time the proposed facility does not plan to make use of above ground 34.5-kV power collection systems.

Exhibit B, pages B-3 and B-4*. Describe the total number of junction boxes that would be included in the collection system.*

The proposed collection system layout (for the entire permit area) contains approximately 28 above ground junction boxes. The design is subject to the result of the geotechnical investigation (mainly the thermal resistivity values) and may therefore change slightly.

Exhibit B, page B-4*. Each of the two substations would occupy a 2-acre site. Describe how much of each site would be occupied by the substation and how the remainder would be surfaced. Would the sites be fenced?*

Each substation will occupy 1 to 1.5 acres of fenced area. The area inside the fence will be graded and leveled and surfaced with gravel. The actual foundations within the substation will be less than a few hundred square feet.

Exhibit B., page B-4*. The O&M building would measure about 5,000 square feet and would be placed on a 5-acre site, a portion of which would be graveled to provide for employee, visitor and equipment parking. Describe how much of the site would be graveled and how the remainder of the 5-acre site would be surfaced. Would the site be fenced?*

The O&M building will have a fence around the parking, laydown area, and the building itself. The proposed fenced area will be 250' by 350'. With the obvious exception of the building footprint, everything within the fence line will have a gravel surface. The remainder of the 5 acre site would not be permanently disturbed.

Exhibit C, pages C-1 and C-2*. Provide tables describing maximum permanent and temporary disturbance for the component parts of the proposed facility. For each component, describe the area affected by a single unit, the maximum number of units, and the total area affected by the maximum number of units.*

For permanent disturbance, address the area affected by the following components:

- *Turbine pads*
- *Turbine turnouts*
- *Substations*
- *O&M facility*
- *34.5-kV power poles*
- *230-kV and 500-kV power poles*
- *Meteorological towers*

- *New access roads*
- *Access road turnarounds*
- *Expansion of existing roads*

For temporary disturbance, address the area affected by the following components:

- *Turbine pads (including associated temporary laydown areas)*
- *Turbine turnouts*
- *Substations*
- *O&M facility*
- *34.5-kV power poles*
- *230-kV and 500-kV power poles*
- *Underground trenching for 34.5-kV power collection system*
- *Meteorological towers*
- *New access roads*
- *Access road turnarounds*
- *Expansion of existing roads*
- *Temporary staging, storage and laydown areas*
- *Crane paths*

The temporary and permanent disturbance amounts included in the amended Exhibit I. Proposed restoration activities for these areas are described in the Mitigation Plan.

EXHIBIT X (Rev 1)

NOISE

OAR 345-021-0010(1)(x)

TABLE OF CONTENTS

TABLES

FIGURES

ATTACHMENT

X.1 INTRODUCTION

Oregon Administrative Rules (OAR) 345-021-0010(1)(x) *Information about noise generated by construction and operation of the proposed facility, providing evidence to support a finding by the Council that the proposed facility complies with the Oregon Department of Environmental Quality's noise control standards in OAR 340-035-0035. The applicant shall include:*

Response:

The following general information on noise is provided to assist the reader in understanding noise and how noise assessments are prepared. Definitions of some common acoustical terms are provided in Table X-1.

Table X-1. Definitions of Acoustical Terms

Term	Definitions
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the sound pressure to the reference pressure which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Equivalent Noise Level (L_{eq})	The energy-averaged A-weighted noise level during the measurement period.
Statistical or Exceedance Noise Level (L_n)	The noise level exceeded during n % of the measurement period, where n is a number between 0 and 100 (e.g., L_{90})
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location. The ambient level is typically defined by the L_{eq} level.
Background Level	The underlying ever-present lower level noise that remains in the absence of intrusive sounds. Distant sources, such as traffic, typically makeup the background. The background level is generally defined by the L_{90} statistical level.
Intrusive Level	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level. The intrusive level is generally defined by the L_{10} statistical level.

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. There are several ways to measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement. In this section, some statistical noise levels are stated in terms of dBA. Noise levels stated in terms of dBA reflect the variable frequency response of the human ear by filtering out some of the noise in the low and high frequency ranges that the ear does not detect well. The A-weighted scale is used in most ordinances and standards. The equivalent sound pressure level (L_{eq}) is defined as the average noise level, on an energy basis, for a stated period of time (e.g., hourly). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electronic filter corresponding to the A-weighted curve. The

sound level meter also performs the calculations required to determine the L_{eq} and other statistical measures for the measurement period.

Statistical measures are used to give insight into the noise level distribution over the measurement period. The L_{90} statistical or exceedance level is a measurement that represents the noise level that is exceeded during 90 percent of the measurement period. L_{90} is indicative of the background sound level in the absence of intrusive sounds. Similarly, the L_{10} represents the noise level exceeded for 10 percent of the measurement period. L_{10} is indicative of nearby traffic noise and other intrusive intermittent sounds. L_{50} is the median sound level, where during half the period the sound level is higher or lower.

In determining the daily level of environmental noise, the difference in response of people to daytime and nighttime noise exposure must be accounted for. During the nighttime, exterior background noise levels are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes more noticeable. Further, most people sleep at night and are sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, most ordinances and standards set the allowable nighttime noise limit 5 to 10 dBA lower than the daytime limit. The daytime and nighttime periods are typically as follows:

- Daytime: 7 a.m.–10 p.m.
- Nighttime: 10 p.m.–7 a.m.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as startle and hearing loss

In most cases, environmental noise produces effects in the first two categories only. However, workers in industrial plants may experience noise effects in the last category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of standard is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or "ambient" environment to which that person has adapted. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the listeners.

With regard to increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this section:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- In a laboratory, a 3 dBA change is considered a just-perceptible difference.

- A change in noise level of at least 5 dBA is required before any noticeable change in response would typically be observed outside a controlled laboratory environment.
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and would likely cause an adverse community response.

Table X-2 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry.

Table X-2. Typical A-Weighted Sound Levels

Sound Level (dBA)*	Location/Source	Subjective Impression
180	Rocket Engine @ 3 feet	Severe pain
160	Sonic Boom	
140	Threshold of Pain	Slight Pain
130	Hydraulic Press @ 3 feet	
120	Pneumatic Riveter @ 3 feet	Extremely Loud
110	Unmuffled Motorcycle @ 3 feet	
100	Chain Saw @ 3 feet	Very Loud
90	Train @ 100 feet	
80	Truck Traffic @ 50 feet	Moderately Loud
70	Auto Traffic @ 50 feet	
60	Normal Conversation	Typical
50	Typical Office	
40	Bedroom at Night	Quiet
30	Soft Whisper	
20	Sound Test Booth	Very Quiet
10	Breathing	
0	Threshold of Hearing	No Sound

Source: Various sources. Compiled by T. Adams.

* A-weighted sound levels are levels that have been adjusted to match the frequency response of the human auditory system.

X.1.1 Study Area and Facility Site

The study area for noise impacts includes all areas that have the potential to be affected by construction or operational noise resulting from the Project.

The Project site consists of hilly agricultural lands with scattered rural residences. The nearest turbine to any residence is about 1,700 feet.

X.1.2 Existing Noise Conditions

A noise survey was conducted at four monitoring locations starting on May 16, 2007, and ending on May 23, 2007. Four Larson-Davis Laboratories Model 820 Precision Integrating Sound Level Meters that meet the requirements of American National Standards Institute (ANSI) Standard S1.4-1983 for Type 1 meters were used for the survey. The microphones

were mounted at a height of about 3 feet above the ground to minimize the generation of noise at the microphone diaphragms by wind, and they were also fitted with foam windscreens to further reduce wind-generated noise. Wind speed decreases dramatically at ground level and even the difference between the standard 5-foot microphone position and the 3-foot position used for the survey reduced the rumbling and popping sounds created by wind impacting the microphone.

The meters were programmed to measure and record the 10-minute L_{eq}, L_{10}, L_{50}, and L_{90} statistical levels. Only the L_{50} levels are presented in this report to correspond with OAR 340-035-0035 Noise Control Regulations for Industry and Commerce requirements. Measurements were conducted by a Board Certified Member of the Institute of Noise Control Engineering, in accordance with ISO 1996 standards and good engineering practice.

The monitoring locations were selected to be representative of residences throughout the Project area. The noise monitoring locations are shown in Figure X-1. A full report of the noise survey, including a description of the monitoring locations, and methodology and results are presented in Attachment X-1.

The measurement results are presented graphically in Exhibit X-1 (Figures 6 through 9) along with the corresponding wind speeds measured at four on-site meteorological towers and extrapolated to the turbine nacelle height of 80 meters. A regression analysis was then performed on these data to determine the relationship between wind speeds and ambient sound levels. To reduce the influence of sounds not related to wind, only nighttime sound levels measured between the hours of 10 p.m. and 6.a.m., when the wind speeds were greater than 10 meters/second (m/s), were used in the regression analysis. The ambient sound levels determined through this process are presented in Table X-3. These levels range from 18.8 to 24.7 dBA when the turbine just begins to operate at its cut-in wind speed. At full load, the levels range from 36.7 to 43.7 dBA in strong winds.

Table X-3. Existing Ambient Sound Levels at Different Wind Speeds

Noise Monitoring Location	Regression Equation*	Calculated Existing Noise Level				
		Cut-In at 4.2 m/s	Quarter Load at 7.0 m/s	Half Load at 8.4 m/s	3/4 Load at 9.8 m/s	Full Load at 13.9 m/s
Location 1	y = 2.0971x + 12.007	20.8	26.7	29.6	32.6	41.2
Location 2	y = 2.5562x + 7.9847	18.8	25.9	29.5	33.1	43.7
Location 3	y = 1.6083x + 15.573	22.3	26.8	29.1	31.3	37.9
Location 4	y = 1.2408x + 19.494	24.7	28.2	29.9	31.7	36.7

* Where y is the predicted sound level and x is the wind speed (see regression charts in Attachment X-1, Figures 10 through 13).

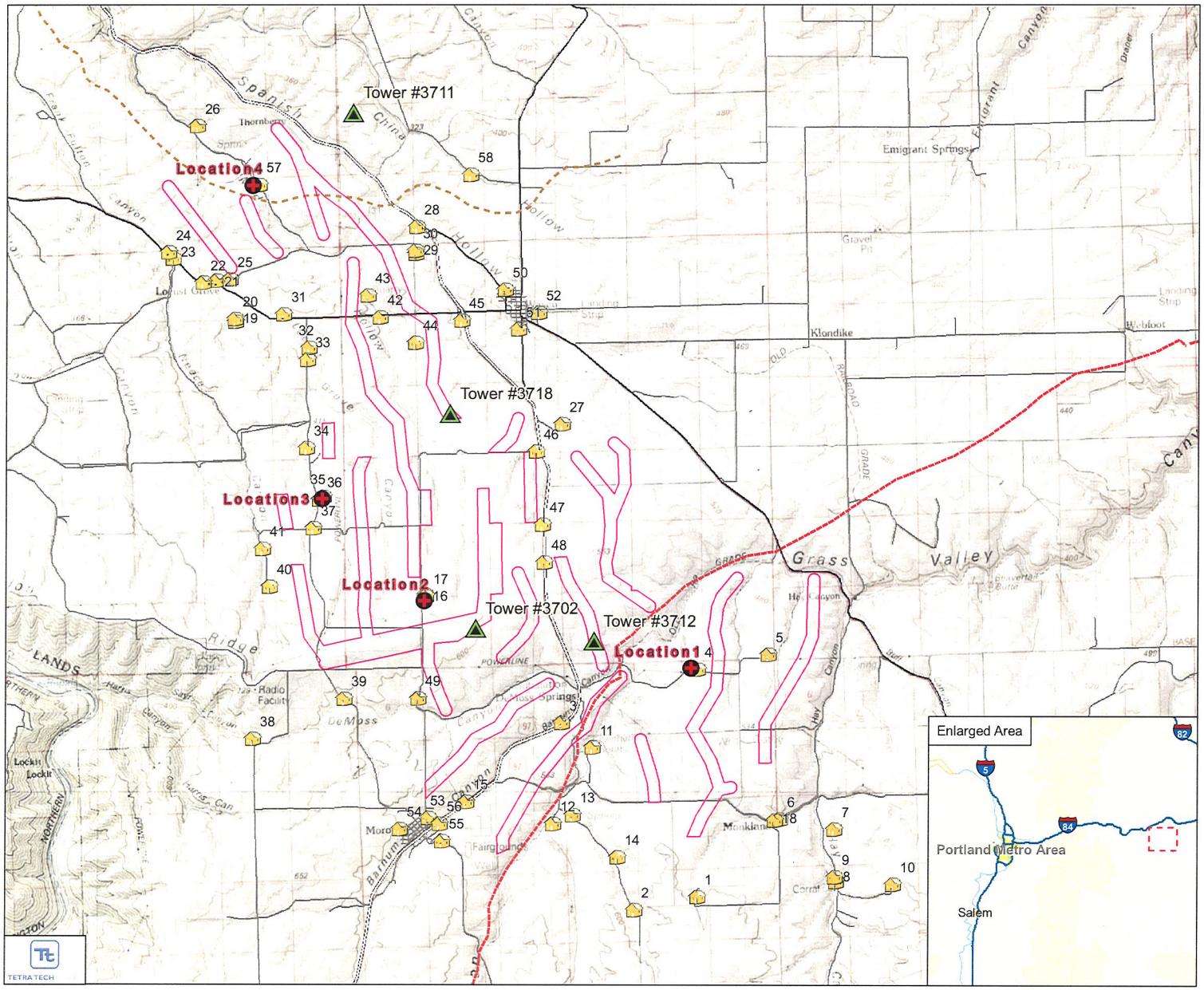

Figure X-1.
Noise Monitoring Locations

BP Golden Hills
Wind Resource Area

Sherman County, OR

alternativenergy

LEGEND

- Meterological Instrument Towers
- Monitoring Microphone
- Dwelling

Project Components

- Corridor

Transportation

- Interstate Highway
- State Highway
- Major Road
- Local Road

1:88,323

0 1 2 3

Miles

Data Sources:
USGS, National Geographic Maps, ESRI
March 6, 2008

X.2 PREDICTED NOISE LEVELS

OAR-345-021-0010(1)(x)(A) *Predicted noise levels resulting from construction and operation of the proposed facility.*

Response:

Noise will be generated during both construction (short-term) and operation (long-term) of the Project.

X.2.1 Construction

Construction of a wind project differs from typical large industrial projects, such as power plants, because the activities are distributed over such a large area and only a small number of construction equipment items are ever in operation simultaneously at a single location. The phases of construction are nonetheless similar to projects of any size. These include: earth moving/excavation for access roads and foundations; concrete pouring for foundations; erection of steel; installation of mechanical and electrical equipment; and site cleanup. Table X-4 lists equipment that may be in use for each phase along with the typical noise level at the standard reference distance of 50 feet.

Table X-4. Typical Sound Levels of Construction Equipment

Construction Equipment	Typical Sound Level at 50 feet
Air Compressor, Portable	81
Backhoe	85
Concrete Mixer Truck	85
Crane, Mobile Tracked	83
Dozer	80
Generator, Portable	78
Grader	85
Loader	79
Pneumatic Tool	85
Truck	85
Welder, Portable	85

Source: EPA, 1971

The most prevalent sound source during construction is anticipated to be the internal combustion engines used to provide mobility and operating power to construction equipment. The sound level impacts at noise sensitive areas from construction operations will depend on the type of equipment used, the mode of operation of the equipment, the length of time the equipment is in use, the amount of equipment used simultaneously, and the distance between the sound source and sensitive site. All of these factors will be constantly changing throughout the construction period, making the calculation of an expected noise level at any residence difficult.

Construction noise mitigation, if required, will include limiting noisy construction activities to daylight hours, ensuring that trucks and portable air compressors are in compliance with federal regulations limiting noise, and ensuring that equipment and sound muffling devices provided by the manufacturers of all equipment are kept in good working condition.

A worst-case scenario might include three pieces of equipment operating at full load at the levels shown in Table X-4 at a single tower site located closest to a residence. Three items at 85 dBA would total 90 dBA at 50 feet. This combined level would attenuate to approximately 58 dBA at the nearest residence approximately 1,700 feet away. Any other combination of turbine site and residence would result in a lower level. A level of 58 dBA during daylight hours would be noticeable but would not constitute a significant noise impact because of the short duration that such maximum levels would exist.

X.2.2 Operation

Computer modeling was used to calculate sound levels that would be generated by operation of the proposed 181 wind turbines. Because a specific turbine model has not been selected at this point, this analysis was based on the loudest turbine of those under consideration (a Clipper C96). When the actual turbines to be installed have been selected, additional computer modeling will be performed to verify the specific predicted levels. Should greater noise impacts be shown in that analysis, appropriate measures such as moving or eliminating some turbines will be taken to limit the potential impacts.

The commercially available CadnaA model (DataKustik, 2006) was used for this analysis. The software takes into account spreading losses; ground and atmospheric effects; shielding from terrain, barriers, and buildings; and reflections from surfaces. The software is standards-based and the ISO 9613 Part 2 standard was used for air absorption and other noise propagation calculations (ISO, 1993). By default, the model assumes that all receptors are downwind of the noise sources, thereby producing a conservative result. The following model options were selected:

- Attenuation of sound due to absorption by the ground was calculated in the model using the "Alternative Method of Ground Absorption" described in the ISO 9613 Part 2 standard. This method is appropriate for elevated sources of noise such as wind turbines.
- Standard atmospheric conditions were selected (temperature of 50 degrees Fahrenheit and a relative humidity of 70 percent), which are favorable to the propagation of sound. This is also a conservative selection since different combinations more applicable to the site will generally produce slightly lower modeled results on the order of tenths of a decibel.
- The search radius was set to 5 kilometers. This means that the contributions of all turbines within 5 km of each receptor were calculated in the total for receptors. Because

of the scattering of sound in the atmosphere, particularly when it is windy, noise from the more distant turbines should not realistically have any contribution, although the model would show a slight increase.

The modeling effort was performed based on the following conservative assumptions:

- The loudest of the turbines under consideration was selected for analysis.
- A 2-dB margin of safety was added to wind turbine sound power levels.
- No credit was taken for shielding of any residence by terrain.
- No credit was taken for the increased distance from wind turbines to residences due to terrain.
- All receptors were treated as if they were simultaneously downwind of all turbines.

Turbine noise levels were modeled at five different load levels ranging from cut-in, when the turbine just begins to operate, to full load, when it is producing the maximum amount of noise. This full range of loads was selected because the turbines produce less noise at low loads, but the wind speeds are also lower, resulting in lower ambient noise levels. It is not clear, without a full analysis, whether the greatest increases in ambient levels occur at full load or at some lower load. For this Project, the greatest increases were found to occur at cut-in when the ambient noise levels are the lowest.

Table X-5 shows the sound power levels used in the model, by octave band, of the turbines at the five load levels analyzed. Sound power is the total acoustic power produced by a noise source and it is independent of the distance from the source. Note that the values in Table X-5 include a safety margin of +2 dB to ensure that the modeled levels are not under-estimated.

Table X-5. A-Weighted Sound Power Levels of a Worst-Case Wind Turbine +2 dB (re 10^{-12} watts)

Turbine Load Level	WS at Hub	Octave Band Center Frequency (Hz)*								Total dBA
		63	125	250	500	1,000	2,000	4,000	8,000	
Cut-in	4.2	84.4	88.9	92.2	94.7	93.3	89.6	82.4	71.8	99.5
¼ load	7.0	87.7	92.2	95.5	98.0	96.6	92.9	85.7	75.1	102.8
½ load	8.4	88.7	93.2	96.5	99.0	97.6	93.9	86.7	76.1	103.8
¾ load	9.8	92.9	97.4	100.7	103.2	101.8	98.1	90.9	80.3	108.0
Full Load	13.9	93.9	98.4	101.7	104.2	102.8	99.1	91.9	81.3	109.0

Levels in the 31.5-Hz band were not reported.
Hz = Hertz (cycles per second)
WS = wind speed

The model results are presented in two ways. The first is a noise contour map that shows the distribution of noise levels over the entire Project area from 30 to 60 dBA with all the turbines operating at full load (Figure X-2). Similar maps are presented in Attachment X-1

for the other four load conditions analyzed. The noise contours are overlaid on a map of the area showing all 181 turbines, all 56 of the closest residences, the Ag Center in Moro, and the DeMoss Springs Park. The noise contour map of the maximum noise levels shows that there are no residences within the 50 dBA or higher contours.

The second method of presentation is a table showing the calculated sound levels at specific receptor points, which are the nearest residences to the turbines in different areas of the Project (Table X-6). In order to present only the most relevant information, the results for only the top 10 residences are shown and are sorted from the highest to the lowest. The complete table is included in Attachment X-1 (Table 5). Table X-6 shows that the maximum calculated sound level at any residence is 47.1 dBA at full load, which is below the 50 dBA limit set by Oregon Department of Environmental Quality (ODEQ). Thus, the Project is expected to be in full compliance with this item of the regulations.

Table X-6. Modeled Turbine Noise Levels for Five Loads at the Top Ten Receptors

	Modeled Levels Sorted from Highest to Lowest				
Receptor ID	Cut-In dBA	1/4 Load dBA	1/2 Load dBA	3/4 Load dBA	Full Load dBA
4	37.6	40.9	41.9	46.1	47.1
16	37.6	40.9	41.9	46.1	47.1
48	37.6	40.9	41.9	46.1	47.1
5	37.5	40.8	41.8	46	47
17	37.5	40.8	41.8	46	47
37	37.5	40.8	41.8	46	47
57	37.5	40.8	41.8	46	47
3	37.3	40.6	41.6	45.8	46.8
35	37.3	40.6	41.6	45.8	46.8
36	37.3	40.6	41.6	45.8	46.8

The ODEQ also limits the increases in existing ambient noise levels caused by wind turbines to no greater than 10 dBA unless a signed waiver is obtained from the affected land owner by the applicant. For this analysis, the site was divided into quadrants and houses within each quadrant were assumed to experience the same ambient noise levels that were measured in the quadrant. The modeled level at each receptor was first added, using decibel addition (Equation 1), to the ambient level to produce the expected future level with the Project in operation. The existing ambient level was then subtracted arithmetically from this future level to determine the increase.

Equation 1 $\quad$ Future Level = 10 log ((10^ (L_A/10) + (10^ (L_P/10))

where: L_A = Ambient Level and L_P = Project Level

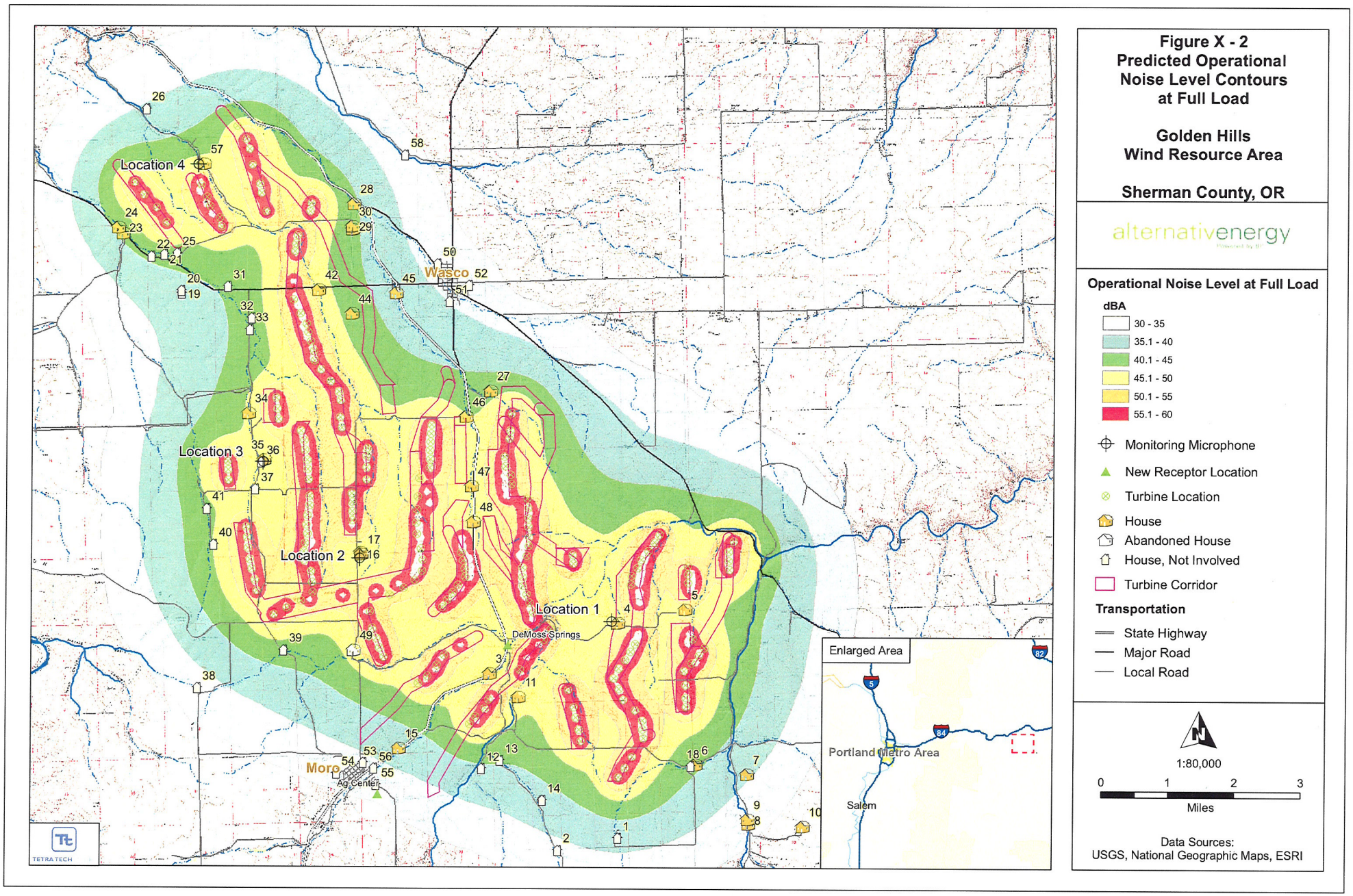

Figure X - 2
Predicted Operational Noise Level Contours at Full Load

Golden Hills Wind Resource Area

Sherman County, OR

alternativeenergy

Operational Noise Level at Full Load

dBA

- 30 - 35
- 35.1 - 40
- 40.1 - 45
- 45.1 - 50
- 50.1 - 55
- 55.1 - 60

- Monitoring Microphone
- New Receptor Location
- Turbine Location
- House
- Abandoned House
- House, Not Involved
- Turbine Corridor

Transportation

- State Highway
- Major Road
- Local Road

1:80,000

0 1 2 3

Miles

Data Sources:
USGS, National Geographic Maps, ESRI

As above, Table X-7 shows the ambient increase results for the top 10 out of 56 residences. The complete table is presented in Attachment X-1 as Table 6. The table shows the expected maximum increases in ambient noise levels at the five different loads as well as the involvement status of each receptor. The 10 dBA limit set by ODEQ is exceeded at a number of receptors, including eight that are not involved in the project. Those involved in the project have already agreed to waive this requirement of the noise standards as part of their contract with the applicant. The first row of the table shows the number of residences that are not project participants where the expected increase in ambient levels is greater than 10 dBA. The receptor number and load levels where this occurs are highlighted in yellow in the table. Only two of these receptors are shown in this table of the top ten residences. The applicant will obtain signed waivers from all eight of the affected landowners.

Table X-7. Calculated Increases in Ambient Levels for the Top Ten Receptors

Receptor ID	Wind Turbine Load Level					Landowner Involved or Not
	Cut-In dBA	Qtr Load dBA	Half Load dBA	¾ Load dBA	Full Load dBA	
Total # of Not-Involved Receptors with Increase > 10 dBA	8	5	4	8	0	
48	18.9	15.1	12.6	13.2	5.0	inv
17	18.8	15.0	12.5	13.1	5.0	inv
47	18.5	14.7	12.3	12.8	4.8	inv
46	17.1	13.4	11.0	11.5	3.9	inv
4	16.9	14.4	12.5	13.7	6.9	inv
16	16.9	14.4	12.5	13.7	6.9	inv
5	16.8	14.3	12.5	13.6	6.8	inv
3	16.6	14.1	12.3	13.4	6.7	inv
11	16.2	13.7	11.9	13.0	6.3	inv
37	15.3	14.2	12.9	14.8	9.6	not

A comparison was also made of the maximum predicted octave band levels at any residence with the ODEQ octave band limits presented in Table X-8. This occurs only when the turbines are operating at full load. Table X-8 summarizes the information presented in Table X-10, but includes two additional rows to show the maximum predicted levels and the difference from the standards levels. The octave band levels were equal to or less than the nighttime octave band limits in all bands. Thus, the project is also expected to be in compliance with this element of the noise standards. None of the predicted octave band levels showed evidence of any tones.

Table X-8. State of Oregon Octave Band Limits Compared Against the Maximum Predicted Octave Band Noise Levels at any Residence

	Octave Band Center Frequencies								
Hertz (cps)	31.5	63	125	250	500	1,000	2,000	4,000	8,000
ODEQ Nighttime Limit (dB)	65	62	56	50	46	43	40	37	34
Project Maximum Predicted Levels (dB)	n.a.*	62	55	50	46	38	26	0	0
Difference	n.a.	0	-1	0	0	-5	-14	-37	-34

* Sound Power Levels in the 31.5-Hz band are typically not reported for wind turbines.

X.3 COMPLIANCE WITH APPLICABLE NOISE REGULATIONS

OAR 345-021-0010(1)(x)(B) *An analysis of the proposed facility's compliance with the applicable noise regulations in OAR 340-035-0035, including a discussion and justification of the methods and assumptions used in the analysis.*

Response:

The results presented in the preceding section indicate that the Project will be in compliance with all aspects of the regulations.

The regulations and results indicating compliance are presented in this section.

X.3.1 Summary of Regulations

OAR Chapter 340, Division 35, was recently revised to specifically address wind energy facilities. Specifically:

- OAR 340-035-0035((1)(b)(B)(iii)(I) establishes the option for a proposed wind energy facility to assume a background L_{50} ambient noise level of 26 dBA.
- OAR 340-035-0035((1)(b)(B)(iii)(IV) requires a proposed wind energy facility to satisfy the ambient noise standard, where a landowner has not waived the standard, by predicting facility noise levels at the appropriate measurement point, assuming that all of the proposed wind facility's turbines are operating between cut-in speed and the wind speed corresponding to the maximum sound power level established by International Electrotechnical Commission Standard (IEC) 61400-11. These predictions are to be compared to the assumed ambient noise level of 26 dBA, or to the actual ambient background L_{10} and L_{50} noise level, if measured. The facility complies with the ambient background standard if this comparison shows that the increase in noise is not more than 10 dBA over this entire range of wind speeds.
- OAR 340-035-0035((1)(b)(B)(iii)(IV) requires that the facility predict compliance with the "Table 8" limits set forth in the regulations, which are summarized in Table X-9. Compliance must occur at the appropriate measurement point, with reference to the turbine's maximum sound power level, following procedures established by IEC 61400-11, and assuming that all of the proposed wind facility's turbines are operating at the maximum sound power level.

OAR Chapter 340, Division 35 contains noise regulations applicable throughout the state of Oregon. Statistical noise limits applicable to the operation of new industrial and commercial noise sources are summarized in Table X-9.

Also, per OAR 340-035-0035(1)(b)(B), the existing ambient L_{50} or L_{10} noise levels cannot be increased by more than 10 dBA.

Table X-9. State of Oregon Statistical Noise Limits for Industrial and Commercial Sources (OAR-340-035-0035)

Statistical Descriptor	Maximum Permissible Statistical Noise Levels (dBA)	
	Daytime (7:00 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)
L_{50}	55	50
L_{10}	60	55
L_1	75	60

Source: Table 8 of OAR 340-035-0035

In addition to the above limits, OAR 340-035-0035(1)(f) establishes standards to regulate octave band sound pressure levels and audible discrete tones. Such standards can be applied by the ODEQ when they believe subsections (1)(a), (b), or (c) (summarized in Table X-9) do not adequately protect the health, safety or welfare of the public.

The most restrictive octave band limits from Table 10 of OAR 340-035-0035 are for nighttime operation and are presented in Table X-10.

Table X-10. State of Oregon Octave Band Limits for Industrial and Commercial Sources Operating at Night (OAR-340-035-0035)

	Octave Band Center Frequencies								
Hertz (cps)	31.5	63	125	250	500	1,000	2,000	4,000	8,000
Nighttime Limit (dB)	65	62	56	50	46	43	40	37	34

The noise limits apply at "appropriate measurement points" on "noise sensitive property." The appropriate measurement point is defined as whichever of the following is farther from the noise source:

- Twenty-five feet toward the noise source from that point on the noise sensitive building nearest the noise source
- That point on the noise sensitive property line nearest the noise source

"Noise sensitive property" is defined as "real property normally used for sleeping, or normally used as schools, churches, hospitals, or public libraries. Property used in industrial or agricultural activities in not Noise Sensitive Property unless it meets the above criteria in more than an incidental manner." Residences are the only noise sensitive property identified in the Project area.

X.3.2 Construction

OAR 340-35-0035(5)(g) specifically exempts noise from construction activity. Thus, by regulatory definition, there will be no construction noise impacts. Additionally, the maximum expected construction noise level of 58 dBA at the closest receptor is on the same level as conversation speech and would not constitute a significant noise impact during the

day in any case. Also, most of the area residences are much further from the turbines than the closest residence analyzed.

Noise generated during the testing and commissioning phase of the Project would not involve heavy construction equipment, and would not be expected to be substantially different from that produced during normal full load operation (see operational impacts below).

Decommissioning activities would be similar in type but shorter in duration as those anticipated for the construction phase. Therefore, decommissioning would not be a significant impact.

X.3.3 Operation

The estimated maximum operational noise levels from the wind turbines are compared with the DEQ L_{50} statistical noise level limits in Table X-9. Since the noise level from the turbines is assumed to be constant, the nighttime L_{50} limit of 50 dBA will be the most restrictive statistical noise limit. The maximum predicted level during full load operation is below 50 dBA at 47.1 dBA.

The ODEQ also does not allow noise from new projects to increase the existing ambient noise levels by more than 10 dBA at any noise sensitive property unless the property owner has waived the requirement. If the property owner is a participant in the Project, he has already agreed to waive this very stringent requirement in his contract with the applicant. The analysis presented above shows that only eight of the residences that are not involved in the project are likely to experience increases in ambient levels of more than 10 dBA (up to 15.3 dBA). The applicant will obtain waivers from these non-participating landowners, thus ensuring compliance with the ambient increase standards.

Table X-8 presented a comparison of the maximum expected octave band levels at any receptor with the limits for each band established in OAR 340-035-350. The predicted octave band levels were equal to or less than the nighttime octave band limits in all bands. Also, no tones were indicated in any of the octave band levels. Thus, the project is also expected to be in compliance with this element of the noise standards.

It has been demonstrated that the Project is expected to be in compliance with all three elements of the noise standards.

X.4 DESCRIPTION OF PROPOSED MITIGATION MEASURES

OAR 345-021-0010(1)(x)(C) *Any measures the applicant proposes to reduce noise levels or noise impacts or to address public complaints about noise from the facility.*

Response:

The primary mitigation available to wind farms is to lay out the turbines in a manner that would ensure compliance with the noise standards. This measure has already been implemented as demonstrated above. This was not feasible at only eight receptors where the predicted increases in ambient noise levels exceeded 10 dBA. Waivers will be obtained from these receptors, thus achieving compliance.

Should complaints arise about noise from the completed facility, a noise survey will be conducted to ensure that the noise does not exceed any component of the standards. If the survey results indicate that the complaints are justified, additional measures, such as operating particular turbines at reduced load levels, will be considered.

X.5 ASSUMPTIONS AND METHODS

OAR 345-021-0010(1)(x)(E) *The assumptions and methods used in the noise analysis; and*

Response:

The assumptions and methods used for these analyses are summarized in the above sections and are described in more detail in Attachment X-1.

X.6 MONITORING PROGRAM

OAR 345-021-0010(1)(x)(D) *Any measures the applicant proposes to monitor noise generated by operation of the facility.*

Response:

At this time, no operational noise monitoring program is planned since no noise impacts are anticipated. As stated above, a noise survey will be performed if noise complaints are received.

X.7 CONCLUSION

The noise analysis presented above and in Attachment X-1 conclude that the Golden Hills Wind Farm Development is expected to be in compliance with all aspects of the ODEQ noise standards contained in OAR-340-035-035.

X.8 REFERENCES

DataKustik GmbH, 2006. *Computer Aided Noise Abatement Model CadnaA*, Version .6. Munich, Germany.

ISO, 1993. International Organization for Standardization. Standard ISO 9613-2 *Acoustics – Attenuation of Sound During Propagation Outdoors, Part 2 General Method of Calculation.* Geneva, Switzerland.

U.S. Environmental Protection Agency (EPA). 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.*

ATTACHMENT X-1 OF EXHIBIT X (REV 1)
GOLDEN HILLS WIND ENERGY DEVELOPMENT
NOISE ASSESSMENT REPORT

Prepared For

BP Alternative Energy

Prepared By

Tetra Tech EC, Inc.
Lakewood, CO

May 2008

GOLDEN HILLS WIND ENERGY DEVELOPMENT
NOISE ASSESSMENT REPORT (REV 1)
SHERMAN COUNTY, OREGON

Prepared For

BP Alternative Energy

Prepared By

Thomas Adams
Senior Noise Analyst

Tetra Tech EC, Inc.
143 Union Blvd, Suite 1010
Lakewood, CO 80228

May 2008

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
cps	cycles per second
dB	decibel
dBA	A-weighted decibel
GPS	global positioning system
HWY	Highway
Hz	Hertz
IEC	International Electrotechnical Commission
m/s	meters per second
MW	megawatt/megawatts
OAR	Oregon Administrative Rules
ODEQ	Oregon Department of Environmental Quality

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1.0 INTRODUCTION

A noise impact assessment was performed for the proposed Golden Hills Wind Energy Development (Project) in Sherman County, Oregon. The Project is expected to produce a maximum power generating capacity of up to 400 megawatts (MW) using up to 181 wind turbines. The noise assessment consists of four parts. The first is a discussion of the applicable Oregon Department of Environmental Quality (ODEQ) noise standards for wind farms. The second is an ambient noise survey of existing noise levels in the Project area, which will be used as a basis for comparison with predicted levels associated with wind turbine operation at all area residences. The third part is computer modeling of wind turbine noise levels to determine the expected operational noise levels from the Project at the residences. The fourth component is the impact assessment that compares overall predicted levels and predicted increases above the existing ambient levels with the 50 A-weighted sound level (dBA) upper limit and the maximum allowable increase of 10 dBA specified in the ODEQ noise standards.

2.0 SUMMARY OF REGULATIONS OAR 345-021-0010(1)(X)(C)

Oregon Administrative Rules (OAR) Chapter 340, Division 35, was recently revised to specifically address wind energy facilities. Specifically:

- OAR 340-035-0035(1)(b)(B)(iii)(I) establishes the option for a proposed wind energy facility to assume a background L_{50} ambient noise level of 26 dBA or to conduct a background noise survey at the proposed site to establish actual levels of ambient noise.

- OAR 340-035-0035(1)(b)(B)(iii)(IV) requires a proposed wind energy facility to satisfy the ambient noise standard, where a landowner has not waived the standard, by predicting facility noise levels at the appropriate measurement point, assuming that all of the proposed wind facility's turbines are operating between cut-in speed and the wind speed corresponding to the maximum sound power level established by International Electrotechnical Commission standard IEC 61400-11. These predictions are to be compared to the assumed ambient noise level of 26 dBA, or to the actual ambient background L_{10} or L_{50} noise level, if measured. The facility complies with the ambient background standard if this comparison shows that the increase in noise is not more than 10 dBA over this entire range of wind speeds.

- OAR 340-035-0035(1)(b)(B)(iii)(IV) requires that the facility predict compliance with the "Table 8" limits set forth in the regulations, which are summarized in Table 1. Compliance must occur at the appropriate measurement point, with reference to the turbine's maximum sound power level, following procedures established by IEC 61400-11, and assuming that all of the proposed wind facility's turbines are operating at the maximum sound power level.

- OAR 340-035-0035(1)(b)(B) also specifies that the existing ambient L_{50} or L_{10} noise levels caused by wind turbine operation cannot be increased by more than 10 dBA.

In addition to the above limits, OAR 340-035-0035(1)(f) establishes standards to regulate octave band sound pressure levels and audible discrete tones. Such standards can be applied by the

ODEQ when they believe subsections (1)(a), (b), or (c) (summarized in Table 1) do not adequately protect the health, safety, or welfare of the public.

Table 1. State of Oregon Statistical Noise Limits for Industrial and Commercial Sources (OAR 340-035-0035)

Statistical Descriptor	Maximum Permissible Statistical Noise Levels (dBA)	
	Daytime (7:00 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)
L_{50}	55	50
L_{10}	60	55
L_1	75	60

Source: Table 8 of OAR 340-035-0035

The most restrictive octave band limits from Table 10 of OAR 340-035-0035 are for nighttime operation and are presented in Table 2.

Table 2. State of Oregon Octave Band Limits for Industrial and Commercial Sources Operating at Night (OAR 340-035-0035)

	Octave Band Center Frequencies								
Hertz (cps)	31.5	63	125	250	500	1,000	2,000	4,000	8,000
Nighttime Limit (dB)	65	62	56	50	46	43	40	37	34

The noise limits apply at "appropriate measurement points" on "noise sensitive property." The appropriate measurement point is defined as whichever of the following is farther from the noise source:

- Twenty-five feet toward the noise source from that point on the noise sensitive building nearest the noise source
- That point on the noise sensitive property line nearest the noise source

"Noise sensitive property" is defined as "real property normally used for sleeping, or normally used as schools, churches, hospitals or public libraries. Property used in industrial or agricultural activities is not Noise Sensitive Property unless it meets the above criteria in more than an incidental manner." Residences are the only noise sensitive property identified in the Project area.

3.0 AMBIENT NOISE SURVEY

The ODEQ allows applicants to use an assumed background noise level of 26 dBA for impact assessment purposes if no background noise survey is conducted. However, a level of 26 dBA is very quiet and does not provide an appropriate comparison with actual, higher background levels that occur under typical turbine operating conditions during high winds. Consequently, the applicant opted to conduct a survey over a 1-week period to document existing noise levels at a wide range of wind speeds to establish the relationship between wind speed and existing sound level. Wind speeds were concurrently measured at four existing on-site meteorological towers during the week-long noise survey.

The noise survey was conducted at four monitoring locations from May 16 through 23, 2007. Four Larson-Davis Laboratories Model 820 Precision Integrating Sound Level Meters that meet the requirements of American National Standards Institute (ANSI) Standard S1.4-1983 for Type 1 meters were used for the survey. The microphones were mounted at a height of about 3 feet above the ground to minimize generation of noise at the microphone diaphragms by wind and were also fitted with foam windscreens to further reduce wind-generated noise. Wind speed decreases dramatically at ground level and even the difference between the standard 5-foot microphone position and the 3-foot position used for this survey reduced the rumbling and popping sounds created by wind impacting the microphone.

The meters were programmed to measure and record the 10-minute Leq, L_{10}, L_{50} and L_{90} statistical levels. Only the L_{50} and L_{10} levels are presented in this report to correspond with OAR 340-035-0035 Noise Control Regulations for Industry and Commerce requirements. Measurements were conducted by a Board Certified Member of the Institute of Noise Control Engineering, in accordance with ISO 1996 standards and good engineering practice.

The monitoring locations described below were selected to be representative of residences throughout the Project area. The distances relative to the farm houses and adjacent roads were measured with a laser range finder, and coordinates of the microphone locations were determined using a Garmin Model 60CSX handheld Global Positioning System (GPS) receiver. The noise monitoring locations are shown in Figure 1. Photographs of the four monitoring locations taken from each microphone location in the direction of the farm house are shown in Figures 2 through 5.

Monitoring Location 1—About 210 feet northwest of the Hart rental house and 140 feet from the road in a grassy area where small farm implements were stored. The house is located on the north side of DeMoss Springs Lane about 1.9 miles east of Highway (Hwy) 97. The microphone location coordinates were N 45° 31' 01.3" latitude and W 120° 39' 01" longitude.

Monitoring Location 2—On the Pinkerton farm about 180 feet south of the farm house and 206 feet from the road at the edge of a wheat field where the crop was about 15 inches tall. The farm is located on the east side of Sawtooth Road about 3.25 miles north of the Town of Moro. The microphone location coordinates were N 45° 31' 56.7" latitude and W 120° 43' 41.4" longitude.

Monitoring Location 3—On the Blaylock farm about 195 feet south of the farm house and 363 feet from the road at the edge of a wheat field where the crop was about 15 inches tall. The farm is located on the east side of VanGilder Road about 2.6 miles south of Hwy 206. The microphone location coordinates were N 45° 33' 14.3" latitude and W 120° 45' 26.9" longitude.

Monitoring Location 4—On the Blau/Larimore farm about 150 feet north of the farm house and 169 feet from the road in the middle of a grassy area where the grass was about 12 inches tall. The farm is located on the west side of Mud Hollow Road about 2.8 miles south of the intersection with Hwy 97. The microphone location coordinates were N 45° 37' 08.2" latitude and W 120° 46' 31.8" longitude.

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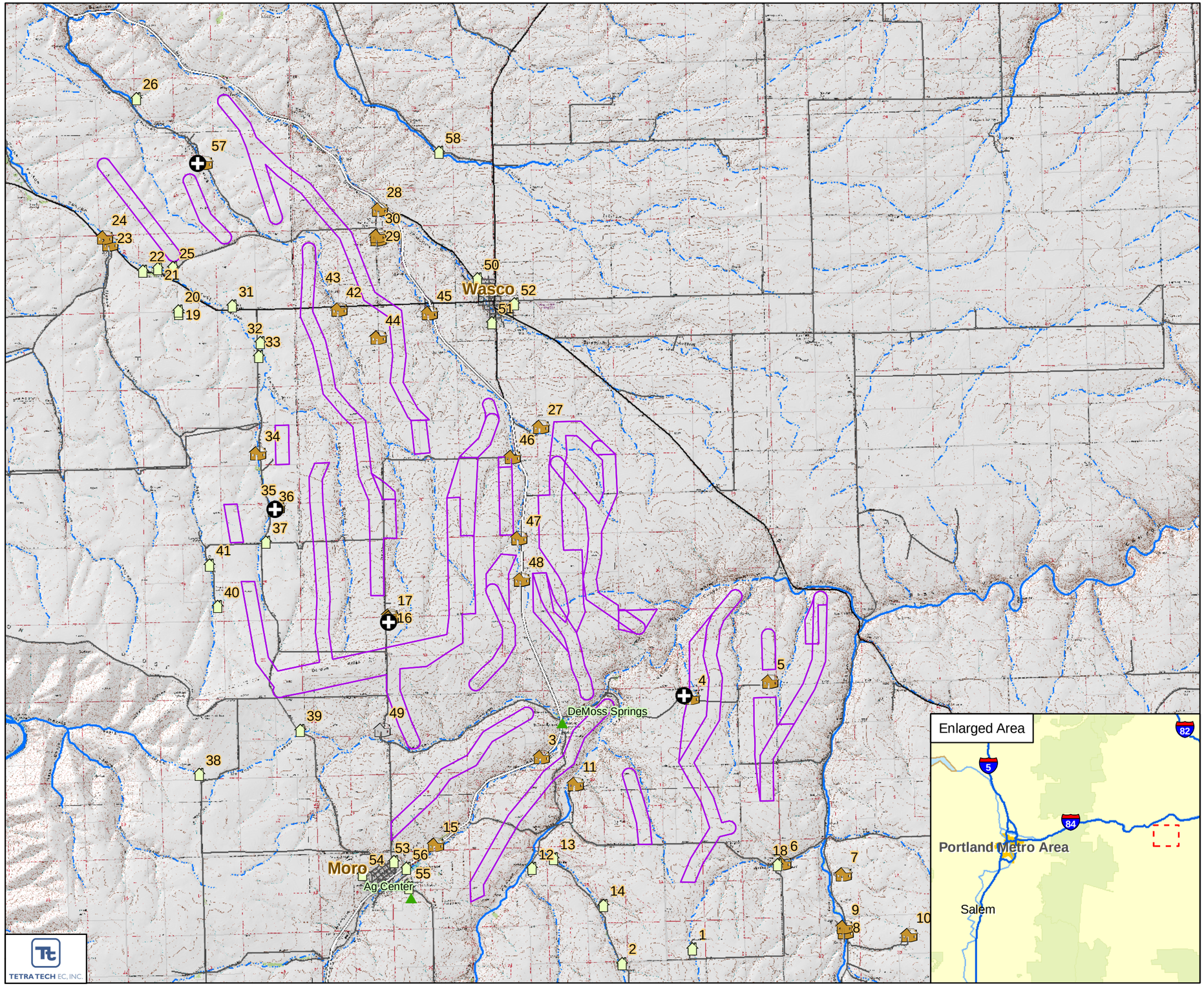
Figure 1
Noise Monitoring Locations

Golden Hills
Wind Resource Area

Sherman County, OR

alternativeenergy
Powered by BP



- Monitoring Microphone
- House
- Abandoned House
- House, Not Involved
- New Receptor Location

Transportation

- US / State Highway
- Major Road
- Local Road

1:80,000

0 1 2 3

Miles

Data Sources:
USGS, National Geographic Maps, ESRI

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Figure 2. Photograph of Noise Monitoring Location 1

Figure 3. Photograph of Noise Monitoring Location 2

Figure 4. Photograph of Noise Monitoring Location 3

Figure 5. Photograph of Noise Monitoring Location 4

Figures 6 through 9 document the existing noise levels measured at the four monitoring locations at a wide range of wind speeds. Only the L_{50} statistical noise level is presented in the charts because this is the metric most applicable to the ODEQ regulations. The L_{50} level is the median level, or the level that is exceeded for 50 percent of each measurement period. The measurements were collected over continuous 10-minute intervals throughout the week-long survey and were summarized into hourly levels by arithmetic averaging. The figures also show the wind speed data concurrently measured at the four existing on-site meteorological towers during the 1-week period.

The charts clearly show two data trends. First, a definite diurnal cycle is evident in both the sound level and wind speed data at each of the monitoring locations. The minimum wind speeds and sound levels occur late at night, while the maximum observations occur during the day. Second, the noise levels appear to track the wind speeds relatively closely, thereby suggesting that the wind is the primary source of noise at these rural sites. This result was expected for these locations because there are no primary sources of manmade noise such as industrial facilities, major highways, and airports. Farming activities produce intermittent noise that is generally filtered out of the L_{50} metric.

Another feature seen in the charts is that the minimum sound levels measured were about 29 to 30 dBA. This level is typically the minimum that most sound levels meters will measure, including those used in this survey. Levels below 30 dBA are usually not significant contributors to any noise impact assessment. However, ODEQ has observed much lower ambient levels, particularly in eastern Oregon, and these lower levels must be taken into consideration when assessing the potential increases in ambient levels.

Therefore, to overcome this instrument limitation, and to establish the expected ambient noise levels over a wide range of wind speeds associated with wind turbine operation, a linear regression was performed on the data from each monitoring location that correlated measured sound levels with wind speeds. The wind speeds were measured at the highest level of the four on-site met towers and extrapolated to the expected turbine nacelle height of 80 meters. During this analysis, it was clear that other sources of noise, not related to wind speed, came into play during periods of very low winds. To reduce the influence of these other sounds, only nighttime sound levels measured between the hours of 10 p.m. and 6.a.m., when the wind speeds were greater than 10 meters/second (m/s), were used in the regression analysis to determine the expected ambient noise levels at all other wind speeds.

The next four charts (Figures 10 through 13) show the results of the linear regression analyses at each monitoring location. With interferences from other noises at low wind speeds eliminated, ambient noise levels due solely to low wind speeds are then extrapolated from the higher winds. The equations provided in the top left corner of each chart allow a calculation of the expected ambient noise level at any wind speed, assuming that the relationship is linear. Tests performed at a different site where a low-noise microphone was used confirmed that the relationship appears linear, thereby validating this approach.

Figure 6. Location 1, 10-Minute L_{50} Sound Levels and Wind Speed

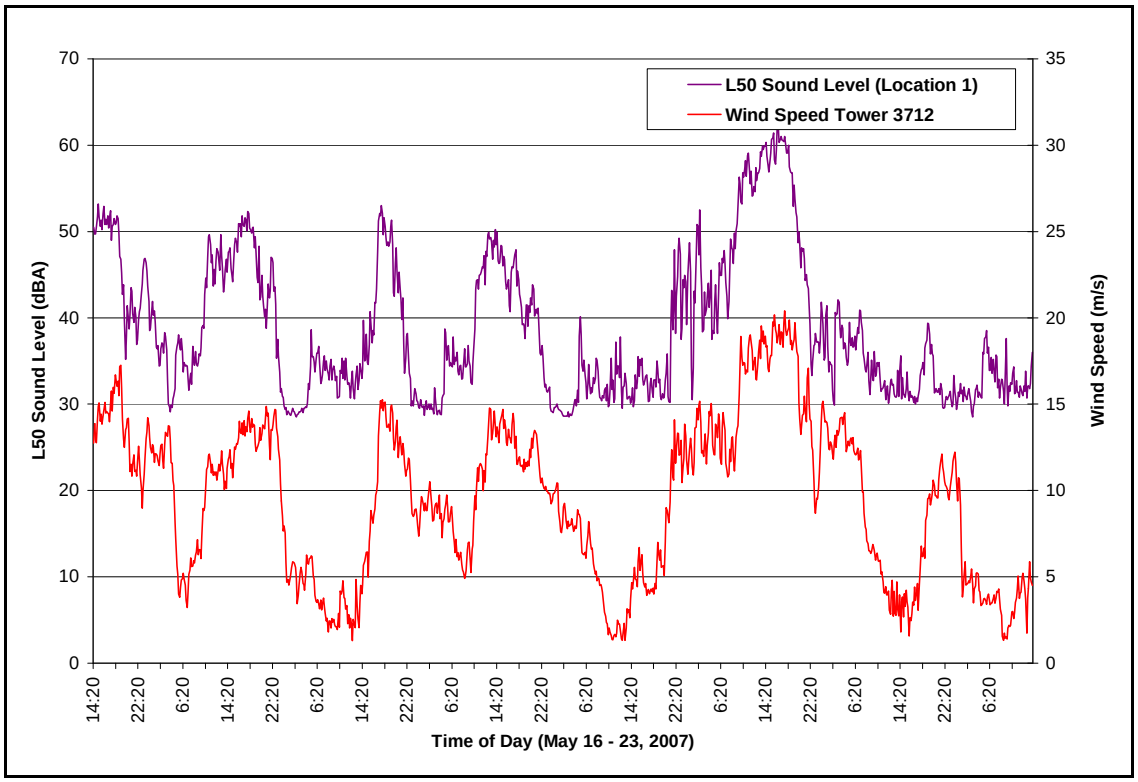


Figure 7. Location 2, 10-Minute L_{50} Sound Levels and Wind Speed

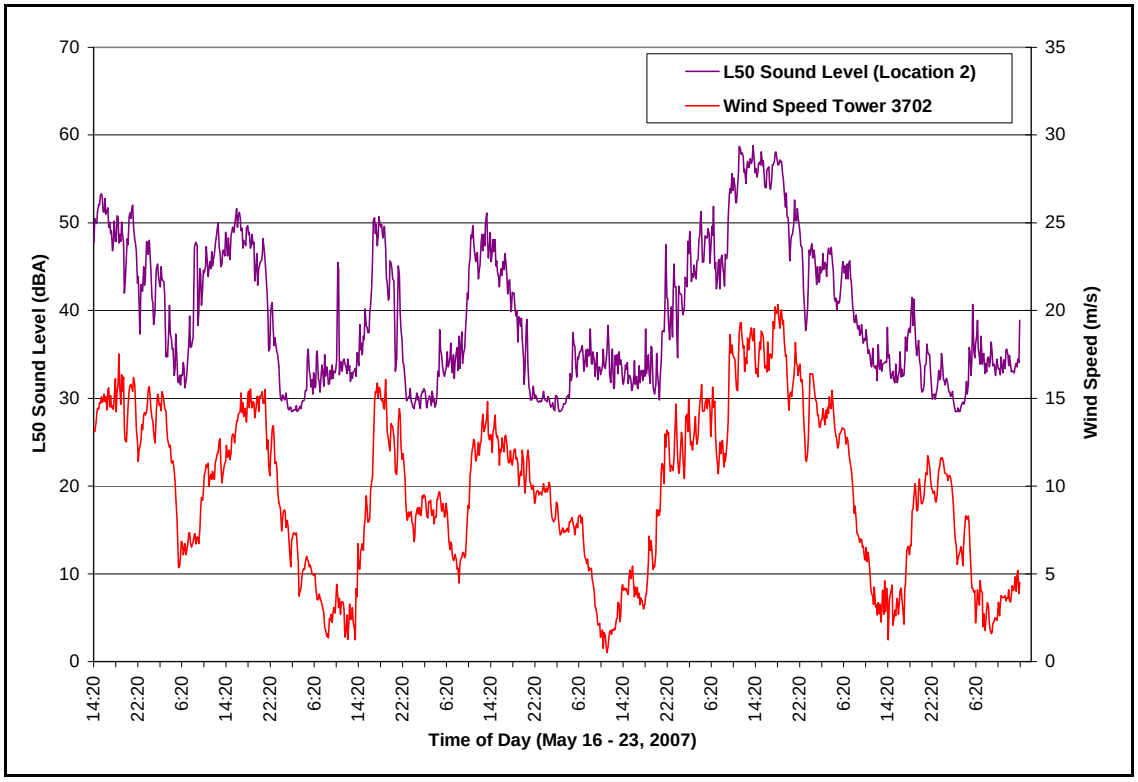


Figure 8. Location 3, 10-Minute L_{50} Sound Levels and Wind Speed

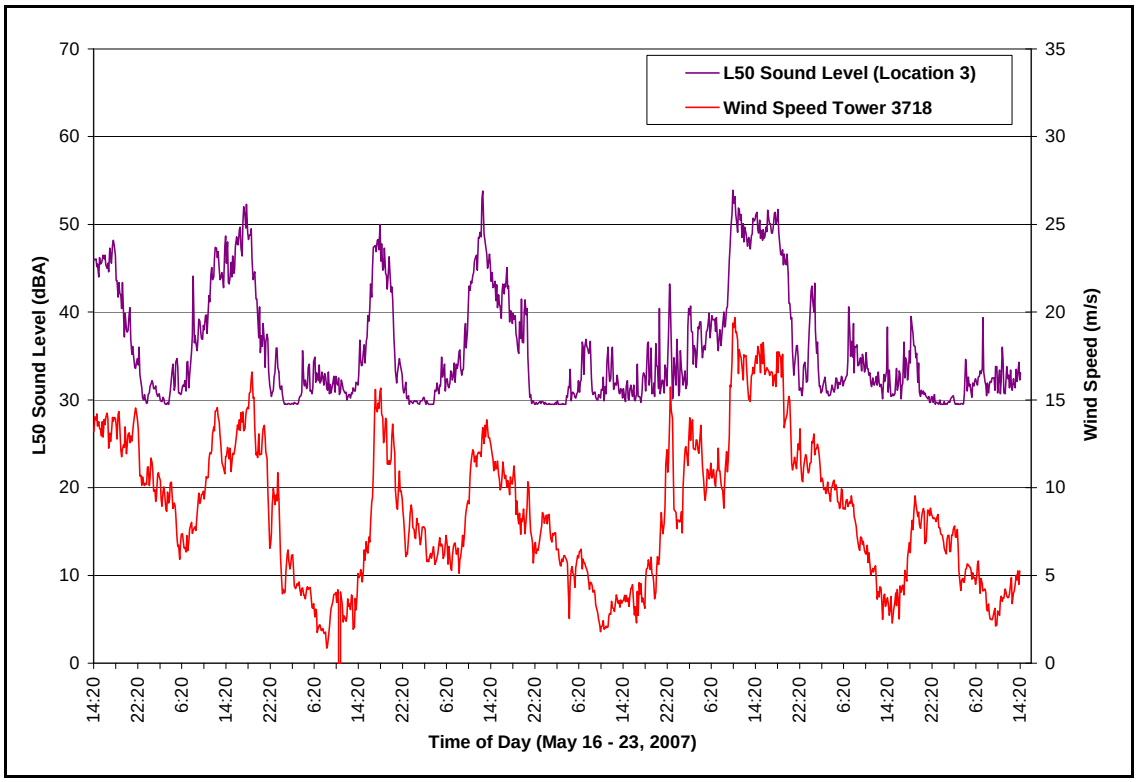


Figure 9. Location 4, 10-Minute L_{50} Sound Levels and Wind Speed

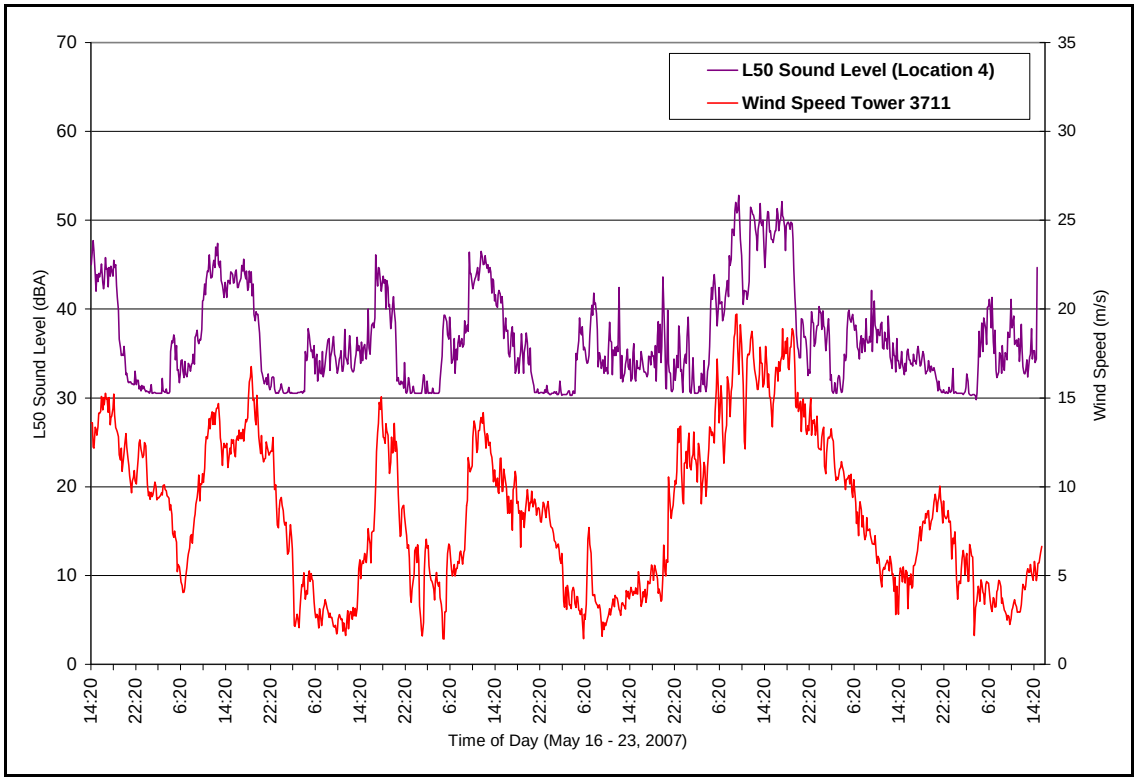


Figure 10. Location 1 Regression Chart

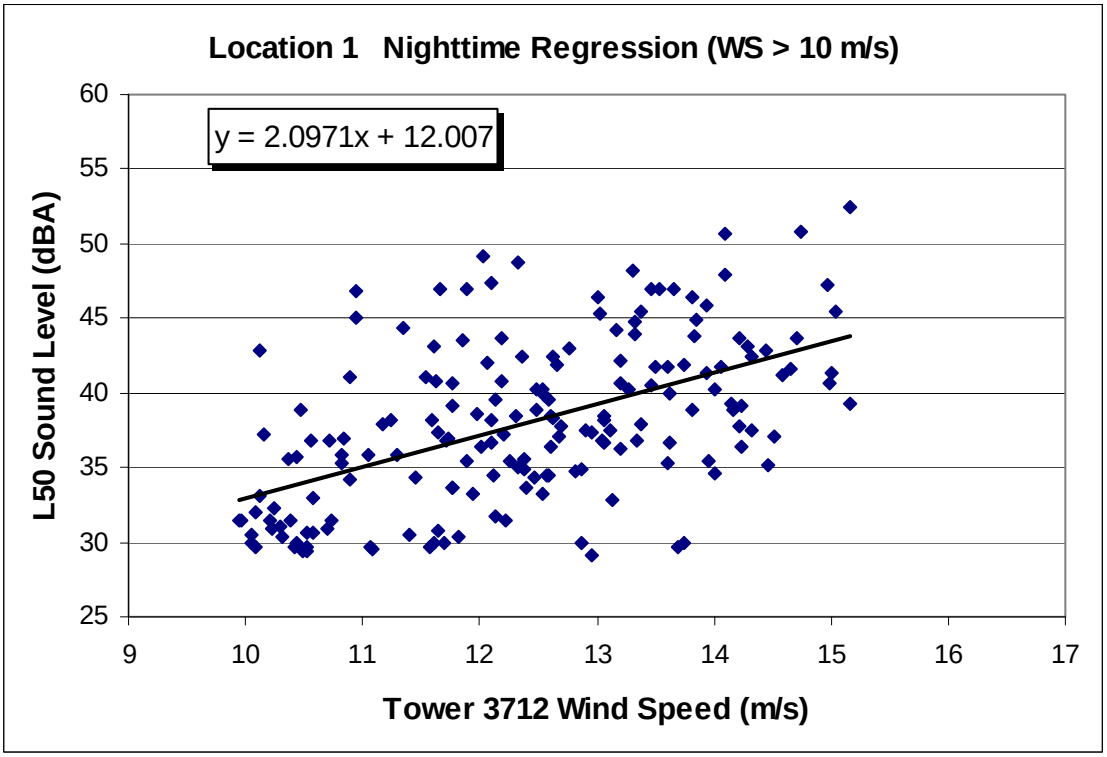


Figure 11. Location 2 Regression Chart

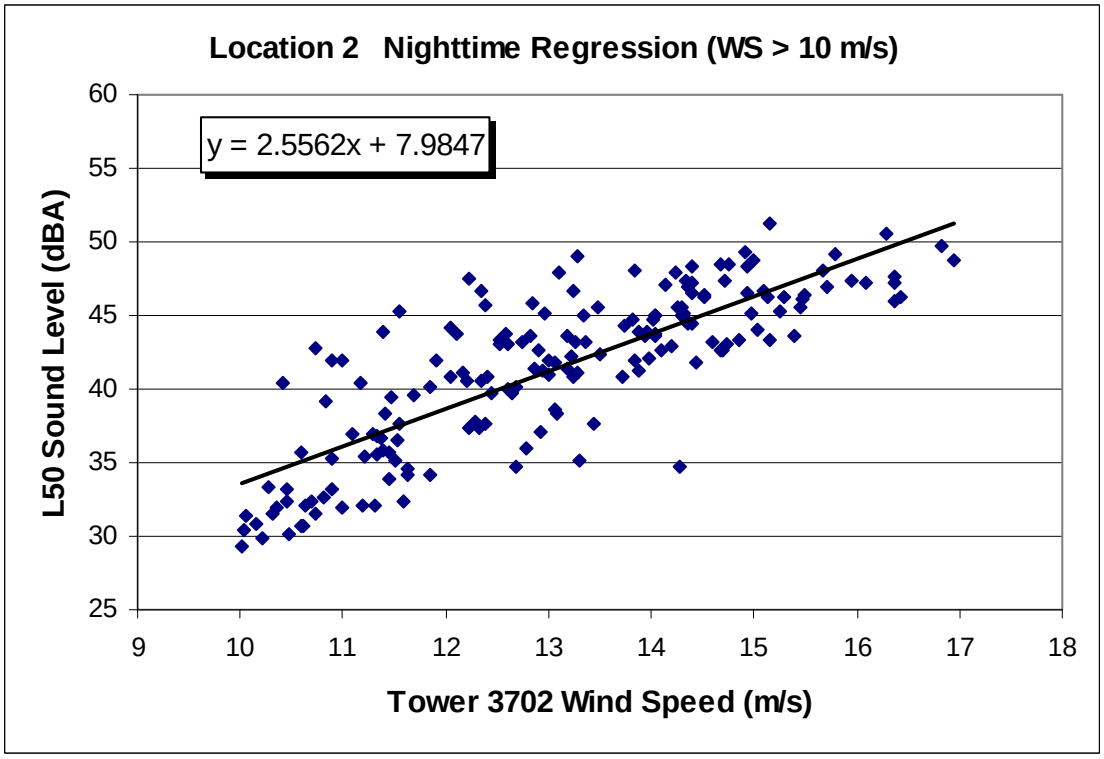


Figure 12. Location 3 Regression Chart

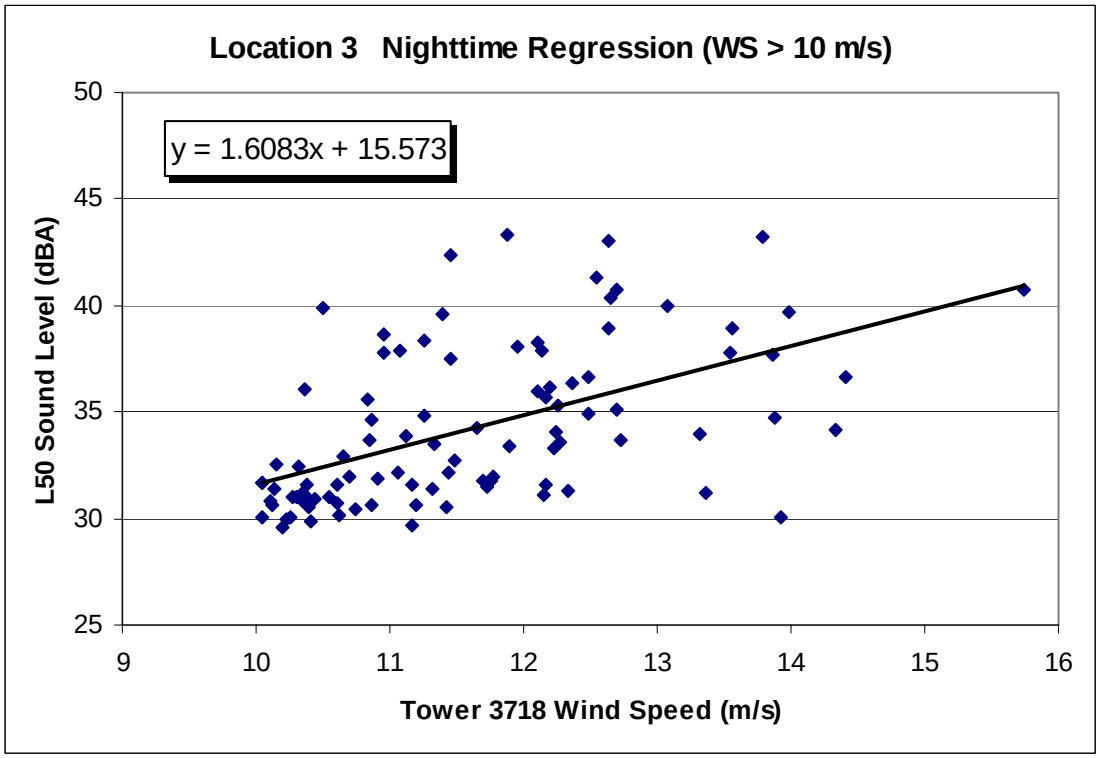
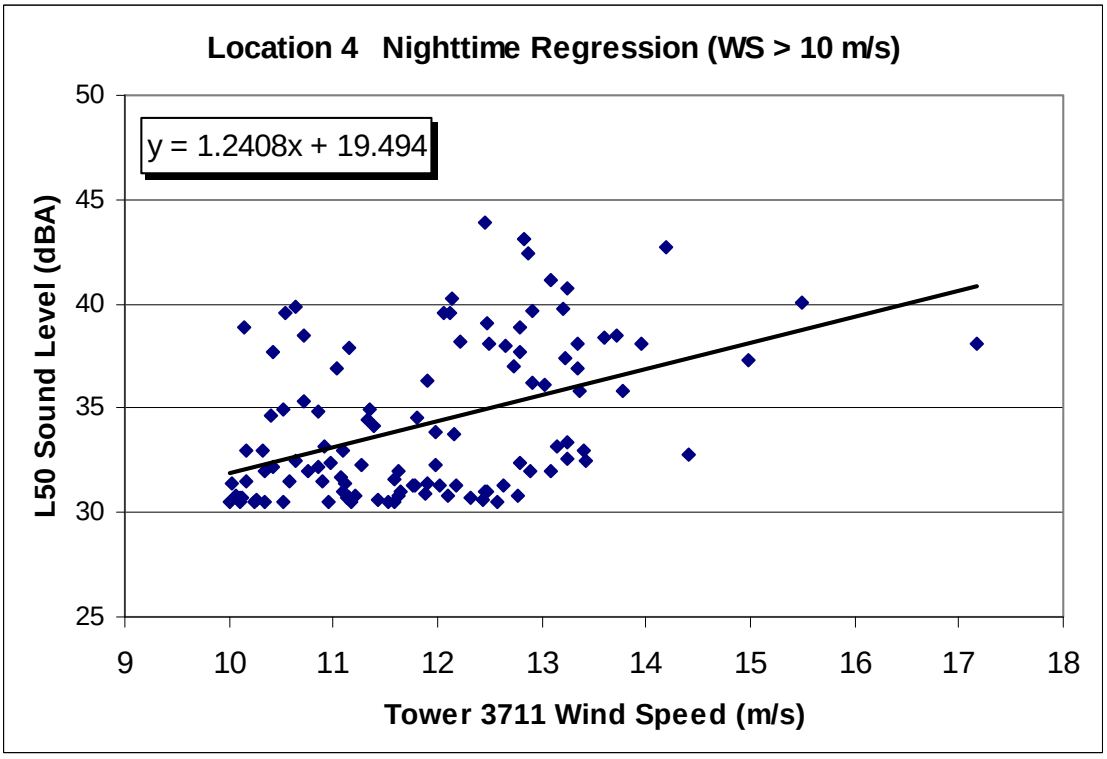


Figure 13. Location 4 Regression Chart



The product of the regression analysis is a determination of the existing sound levels expected at the specific wind speeds associated with wind turbine operation at different load levels ranging from cut-in to full load (4.2 m/s to 13.9 m/s and above at hub height). These values, calculated from the regression equation shown in each chart and presented in Table 3, will be compared with the turbine operational noise predicted at each residence to determine the expected increase in the ambient sound levels produced by Project operation. These levels range from 18.8 to 24.7 dBA when the turbine just begins to operate at its cut-in wind speed. At full load, the levels range from 36.7 to 43.7 dBA in strong winds.

Table 3. Existing Ambient Sound Levels at Different Wind Speeds

Noise Monitoring Location	Regression Equation*	Calculated Existing Noise Level				
		Cut-In at 4.2 m/s	Quarter Load at 7.0 m/s	Half Load at 8.4 m/s	3/4 Load at 9.8 m/s	Full Load at 13.9 m/s
Location 1	y = 2.0971x + 12.007	20.8	26.7	29.6	32.6	41.2
Location 2	y = 2.5562x + 7.9847	18.8	25.9	29.5	33.1	43.7
Location 3	y = 1.6083x + 15.573	22.3	26.8	29.1	31.3	37.9
Location 4	y = 1.2408x + 19.494	24.7	28.2	29.9	31.7	36.7

* Where y is the predicted sound level and x is the wind speed

4.0 WIND TURBINE NOISE MODELING

Computer modeling was used to calculate sound levels that would be generated by operation of the proposed 181 wind turbines. Because a specific turbine model has not been selected, this analysis was based on the loudest turbine of those under consideration (a Clipper C96). When the actual turbines to be installed have been selected, additional computer modeling will be performed to verify the specific predicted levels. Should greater noise impacts be shown in that analysis, appropriate measures such as moving or eliminating some turbines will be taken to limit the potential impacts.

The commercially available CadnaA model (DataKustik, 2006) was used for this analysis. The software takes into account spreading losses; ground and atmospheric effects; shielding from terrain, barriers and buildings; and reflections from surfaces. The software is standards-based and the ISO 9613 Part 2 standard was used for air absorption and other noise propagation calculations (ISO, 1993). By default, the model assumes that all receptors are downwind of the noise sources, thereby producing a conservative result. The following model options were selected:

- Attenuation of sound due to absorption by the ground was calculated in the model using the "Alternative Method of Ground Absorption" described in ISO 9613 Part 2 standard. This method is appropriate for elevated sources of noise such as wind turbines.

- Atmospheric conditions were selected as the standard atmosphere, which is a temperature of 50 degrees Fahrenheit and a relative humidity of 70 percent. This is also a conservative selection since different combinations more applicable to the site will generally produce slightly lower modeled results on the order of tenths of a decibel.

- The search radius was set to 5 kilometers. This means that the contributions of all turbines within 5 km of each receptor were calculated in the total for receptors. Because of the scattering of sound in the atmosphere, particularly when it is windy, noise from the more distant turbines should not realistically have any contribution, although the model results would show a slight increase.

The modeling effort was performed based on the following conservative assumptions:

- The loudest of the turbines under consideration was selected for analysis.
- A 2-dB margin of safety was added to wind turbine sound power levels.
- No credit was taken for shielding of any residence by terrain.
- No credit was taken for the increased distance from wind turbines to residences due to terrain.
- All receptors were treated as if they were simultaneously downwind of all turbines.

Turbine noise levels were modeled at five different load levels ranging from cut-in, when the turbine just begins to operate, to full load when it is producing the maximum amount of noise. This full range of loads was selected because the turbines produce less noise at low loads, but the wind speeds are also lower resulting in lower ambient noise levels. It is not clear, without a full analysis, whether the greatest increases in ambient levels occur at full load or at some lower load. For this Project, the greatest increases were found to occur at cut-in when the ambient levels were lowest. This result will be clearer as the methodology is described more fully below.

Table 4 shows the sound power levels used in the model, by octave band, of the turbines at the five load levels analyzed. Sound power is the total acoustic power produced by a noise source and it is independent of the distance from the source. Although sound power and sound pressure are both measured in terms of decibels, the scales are different because sound power is referenced to watts, which is a measure of power and pressure is referenced to pressure as indicated by the name. Thus, a sound power level of 109 dBA for the worst-case turbine will not sound like a level of 109 dBA even when right at the nacelle. Noise levels at the nacelle of a wind turbine would likely be on the order of 70 to 80 dBA sound pressure. At ground level, the sound pressure level would be significantly lower. Note that the values in Table 4 include a safety margin of +2 dB to ensure that the modeled levels are not under-estimated.

Table 4. A-Weighted Sound Power Levels of a Worst-Case Wind Turbine + 2 dB (re 10^{-12} watts)

Turbine Load Level	WS at Hub	Octave Band Center Frequency (Hz)*								Total dBA
		63	125	250	500	1,000	2,000	4,000	8,000	
Cut-in	4.2	84.4	88.9	92.2	94.7	93.3	89.6	82.4	71.8	99.5
1/4 load	7.0	87.7	92.2	95.5	98	96.6	92.9	85.7	75.1	102.8
1/2 load	8.4	88.7	93.2	96.5	99	97.6	93.9	86.7	76.1	103.8
3/4 load	9.8	92.9	97.4	100.7	103.2	101.8	98.1	90.9	80.3	108
Full Load	13.9	93.9	98.4	101.7	104.2	102.8	99.1	91.9	81.3	109

Levels in the 31.5-Hz band were not reported. WS = wind speed
Hz = Hertz (cycles per second [cps])

The model results are presented both graphically and in tabular form. A series of noise contour maps (Figures 14 through 18) show the distribution of expected noise levels from the turbines over the entire Project area from 30 to 60 dBA at each of the five turbine loads analyzed. The noise contours are overlaid on the topographic map of the area showing all 181 turbines, all 56 of the closest residences, the Ag Center in Moro, and the DeMoss Springs Park. The noise contour maps show that there are no residences within the 50 dBA or higher contours. As would be expected, the area covered by the contours increases with increasing load. Table 5 shows that the maximum calculated sound level at any residence is 47.1 dBA at full load and above, which is below the 50 dBA limit set by ODEQ. Thus, the Project is expected to be in full compliance with this item of the regulations.

The ODEQ also limits the increases in existing ambient noise levels caused by wind turbines to no greater than 10 dBA unless a signed waiver is obtained from the affected land owner by the applicant. Table 3 presents the applicable existing ambient noise levels at different wind speeds associated with the wind turbine operation at the five load levels. For this analysis, the site was divided into quadrants and houses within each quadrant were assumed to experience the same ambient noise levels that were measured in the quadrant. The modeled level at each receptor was first added, using decibel addition (Equation 1), to the ambient level to produce the expected future level with the Project in operation. The existing ambient level was then subtracted arithmetically from this future level to determine the increase.

Equation 1 $$\text{Future Level} = 10 \log ((10^{\wedge} (L_A/10) + 10^{\wedge} (L_P/10))$$

Where: L_A = Ambient Level
L_P = Project Level

Five noise increase contour maps are presented to show these increases from 5 to 25 dBA throughout the area at the different loads (Figures 19 through 23). Since the noise model will not accept different ambient levels for each receptor, the ambient levels for all four quadrants were averaged for each load level to produce these maps. However, the table of increases (Table 6) is based on the specific ambient noise levels for each receptor and these values are used for determination of compliance with the ODEQ standards.

Table 6 shows the expected maximum increases in ambient noise levels at the five different loads as well as the involvement status of each receptor. The 10 dBA limit set by ODEQ is exceeded at a number of receptors, including eight that are not involved in the project. Those involved in the project have already agreed to waive this requirement of the noise standards as part of their contract with the applicant. The first row of the table shows the number of residences that are not project participants where the expected increase in ambient levels is greater than 10 dBA. The receptor number and load levels where this occurs are highlighted in yellow in the table. The applicant will obtain signed waivers from all eight of the affected landowners.

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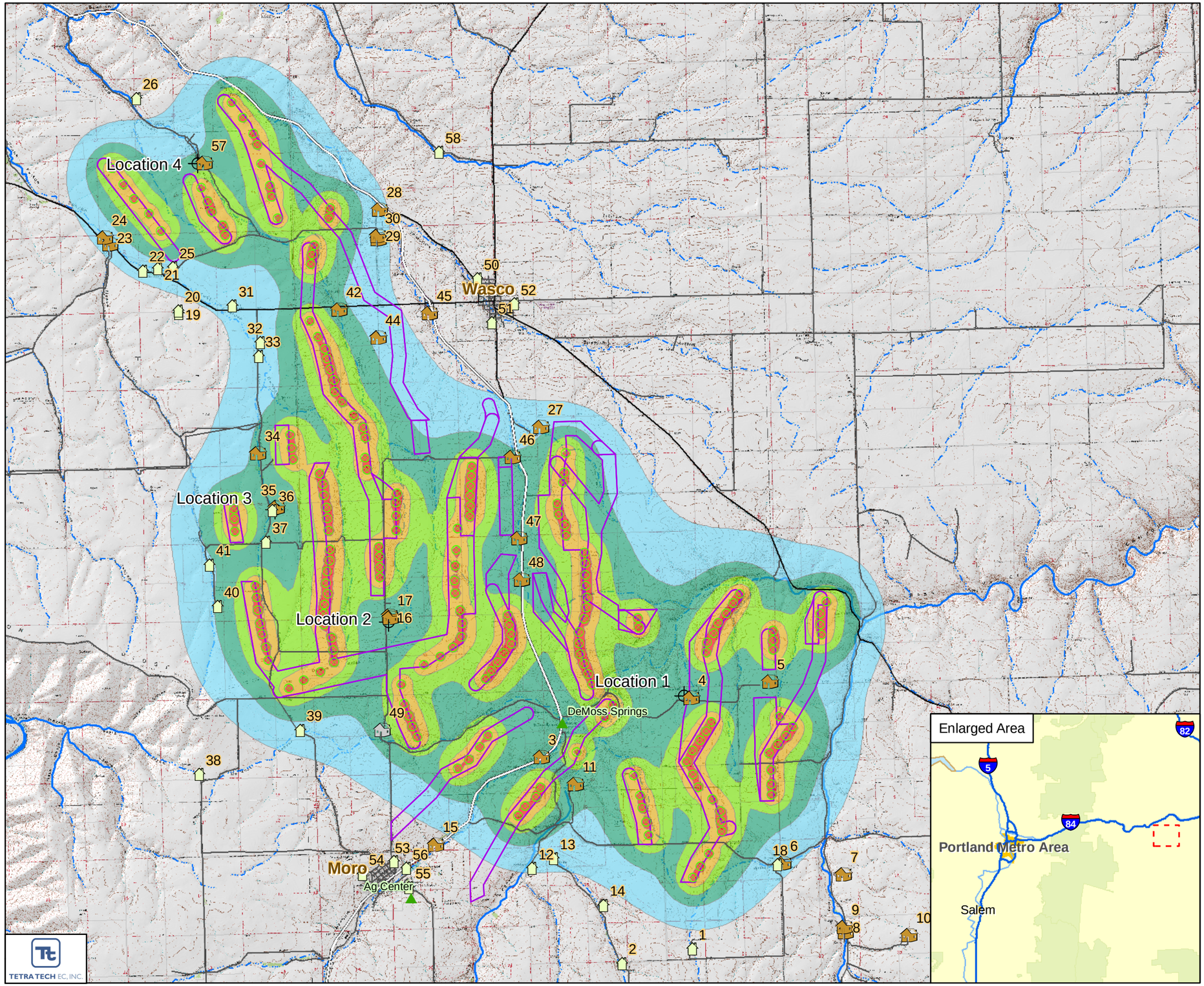


Figure 14
Predicted Operational Noise Level Contours at Cut-In

Golden Hills Wind Resource Area

Sherman County, OR

alternativenergy
Powered by BP

Operational Noise Level at Cut-In (dBA)

Noise Level (dBA)

- 30 - 35
- 35.1 - 40.0
- 40.1 - 45.0
- 45.1 - 50.0
- 50.1 - 55.0

- Monitoring Microphone
- New Receptor Location
- Turbine Location
- House
- Abandoned House
- House, Not Involved
- Turbine Corridor

Transportation

- US / State Highway
- Major Road
- Local Road

1:80,000

0 1 2 3

Miles

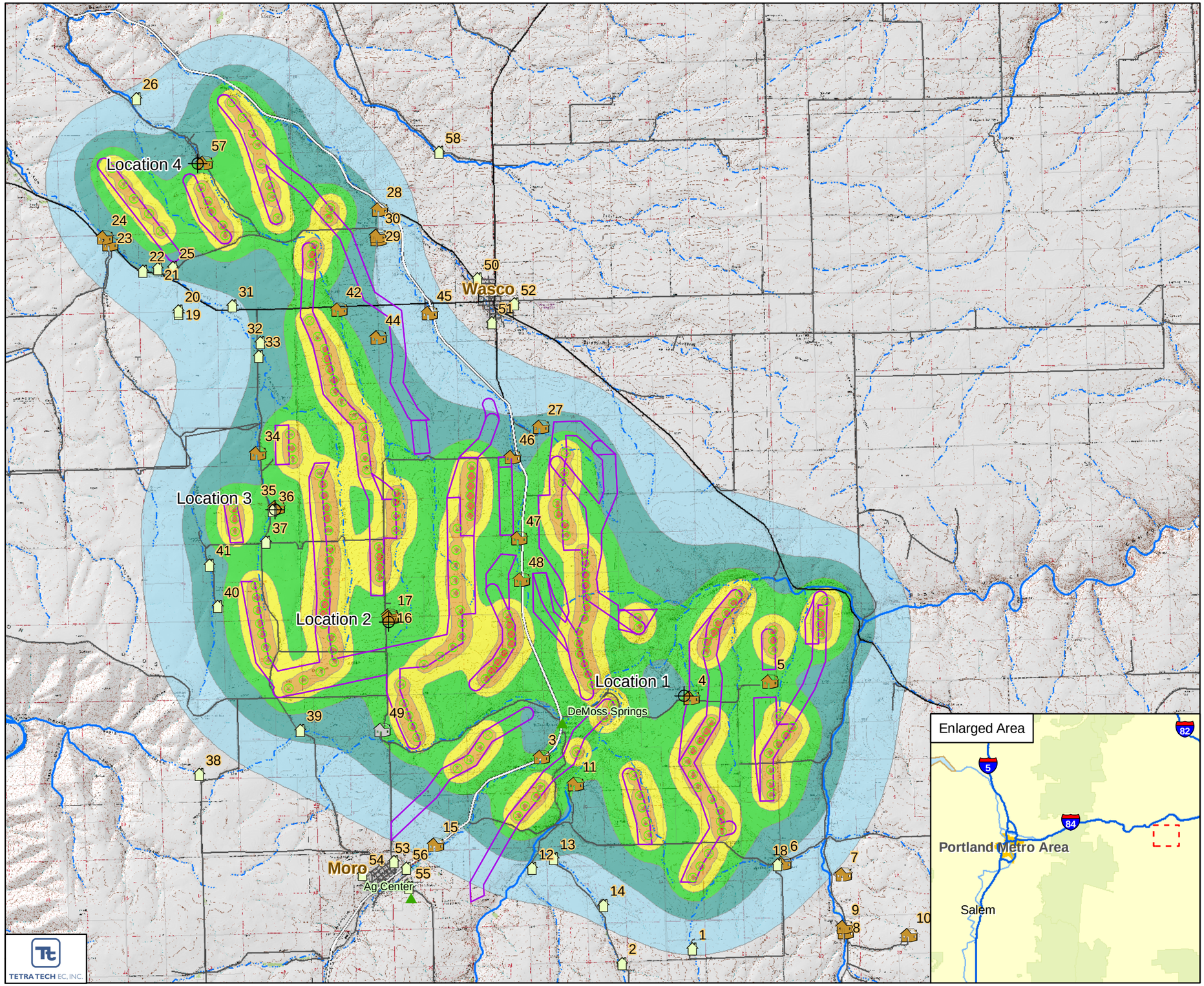
Data Sources:
USGS, National Geographic Maps, ESRI

Figure 15
Predicted Operational Noise Level Contours at 1/4 Load

Golden Hills Wind Resource Area

Sherman County, OR

alternativeenergy
Powered by BP



Operational Noise Level at 1/4 Load

dBA

- 30 - 35
- 35.1 - 40
- 40.1 - 45
- 45.1 - 50
- 50.1 - 55
- 55.1 - 60

- Monitoring Microphone
- New Receptor Location
- Turbine Location
- House
- Abandoned House
- House, Not Involved
- Turbine Corridor

Transportation

- US / State Highway
- Major Road
- Local Road

1:80,000

0 1 2 3

Miles

Data Sources:
USGS, National Geographic Maps, ESRI

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Figure 16
Predicted Operational Noise Level Contours at Half Load

Golden Hills Wind Resource Area

Sherman County, OR

alternativeenergy
Powered by BP

Operational Noise Level at 1/2 Load

dBA

- 30 - 35
- 35.1 - 40
- 40.1 - 45
- 45.1 - 50
- 50.1 - 55
- 55.1 - 60

- Monitoring Microphone
- New Receptor Location
- Turbine Location
- House
- Abandoned House
- House, Not Involved
- Turbine Corridor

Transportation

- US / State Highway
- Major Road
- Local Road

Location 1
Location 2
Location 3
Location 4
Wasco
Moro
Ag Center
DeMoss Springs

Enlarged Area
Portland Metro Area
Salem

1:80,000

0 1 2 3
Miles

Data Sources:
USGS, National Geographic Maps, ESRI

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Figure 17
Predicted Operational Noise Level Contours at 3/4 Load

Golden Hills Wind Resource Area

Sherman County, OR

alternativenergy
Powered by BP

Operational Noise Level at 3/4 Load

dBA

- 30 - 35
- 35.1 - 40
- 40.1 - 45
- 45.1 - 50
- 50.1 - 55
- 55.1 - 60

- Monitoring Microphone
- New Receptor Location
- Turbine Location
- Turbine Corridor
- House
- Abandoned House
- House, Not Involved

Transportation

- US/ State Highway
- Major Road
- Local Road

1:80,000

0 1 2 3

Miles

Data Sources:
USGS, National Geographic Maps, ESRI

Location 1
Location 2
Location 3
Location 4
Wasco
Moro
Ag Center
DeMoss Springs

Enlarged Area
Portland Metro Area
Salem

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Thursday, May 8, 2008 2:54:41 PM
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Figure 18
Predicted Operational Noise Level Contours at Full Load

Golden Hills Wind Resource Area

Sherman County, OR

alternativenergy
Powered by BP

Operational Noise Level at Full Load
dBA

- 30 - 35
- 35.1 - 40
- 40.1 - 45
- 45.1 - 50
- 50.1 - 55
- 55.1 - 60

- Monitoring Microphone
- New Receptor Location
- Turbine Location
- House
- Abandoned House
- House, Not Involved
- Turbine Corridor

Transportation

- State Highway
- Major Road
- Local Road

Enlarged Area

Portland Metro Area

Salem

1:80,000

0 1 2 3
Miles

Data Sources:
USGS, National Geographic Maps, ESRI

TETRA TECH EC, INC.

Table 5. Modeled Turbine Noise Levels for Five Loads at Each Receptor

Receptor ID	Modeled Levels at Each Receptor				
	Cut-In dBA	1/4 Load dBA	1/2 Load dBA	3/4 Load dBA	Full Load dBA
1	27.4	30.7	31.7	35.9	36.9
2	24.2	27.5	28.5	32.7	33.7
3	37.3	40.6	41.6	45.8	46.8
4	37.6	40.9	41.9	46.1	47.1
5	37.5	40.8	41.8	46	47
6	31.2	34.5	35.5	39.7	40.7
7	25.9	29.2	30.2	34.4	35.4
8	22.4	25.7	26.7	30.9	31.9
9	22.8	26.1	27.1	31.3	32.3
10	18.2	21.5	22.5	26.7	27.7
11	36.9	40.2	41.2	45.4	46.4
12	30.6	33.9	34.9	39.1	40.1
13	31.5	34.8	35.8	40	41
14	28.4	31.7	32.7	36.9	37.9
15	28.6	31.9	32.9	37.1	38.1
16	37.6	40.9	41.9	46.1	47.1
17	37.5	40.8	41.8	46	47
18	31.6	34.9	35.9	40.1	41.1
19	28.6	31.9	32.9	37.1	38.1
20	28.8	32.1	33.1	37.3	38.3
21	32.8	36.1	37.1	41.3	42.3
22	31.6	34.9	35.9	40.1	41.1
23	31.9	35.2	36.2	40.4	41.4
24	32	35.3	36.3	40.5	41.5
25	33.3	36.6	37.6	41.8	42.8
26	27.9	31.2	32.2	36.4	37.4
27	33.7	37	38	42.2	43.2
28	31.2	34.5	35.5	39.7	40.7
29	31.5	34.8	35.8	40	41
30	31.6	34.9	35.9	40.1	41.1
31	31.1	34.4	35.4	39.6	40.6
32	32.7	36	37	41.2	42.2
33	32.5	35.8	36.8	41	42
34	36.5	39.8	40.8	45	46
35	37.3	40.6	41.6	45.8	46.8
36	37.3	40.6	41.6	45.8	46.8
37	37.5	40.8	41.8	46	47
38	23.5	26.8	27.8	32	33
39	33.3	36.6	37.6	41.8	42.8

Table 5. Modeled Turbine Noise Levels for Five Loads at Each Receptor (Concluded)

Receptor ID	Modeled Levels at Each Receptor				
	Cut-In dBA	1/4 Load dBA	1/2 Load dBA	3/4 Load dBA	Full Load dBA
40	35.7	39	40	44.2	45.2
41	34.3	37.6	38.6	42.8	43.8
42	36.8	40.1	41.1	45.3	46.3
44	33.6	36.9	37.9	42.1	43.1
45	28.2	31.5	32.5	36.7	37.7
46	35.8	39.1	40.1	44.3	45.3
47	37.2	40.5	41.5	45.7	46.7
48	37.6	40.9	41.9	46.1	47.1
50	23.9	27.2	28.2	32.4	33.4
51	25.4	28.7	29.7	33.9	34.9
52	23.4	26.7	27.7	31.9	32.9
53	25	28.3	29.3	33.5	34.5
54	22.8	26.1	27.1	31.3	32.3
55	23.4	26.7	27.7	31.9	32.9
56	24.9	28.2	29.2	33.4	34.4
57	37.5	40.8	41.8	46	47
58	22.8	26.1	27.1	31.3	32.3

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Figure 19
Predicted Increases in Ambient Noise Levels at Cut-In

Golden Hills Wind Resource Area

Sherman County, OR

alternativeenergy
Powered by BP

Ambient Noise Increase at Cut-In (dBA)

- 0 - 5
- 5.1 - 10
- 10.1 - 15
- 15.1 - 20
- 20.1 - 25
- 25.1 - 30

- Monitoring Microphone
- Turbine Location
- New Receptor Location
- Turbine Corridor
- House
- Abandoned House
- House, Not Involved

Transportation

- US / State Highway
- Major Road
- Local Road

1:80,000

0 1 2 3
Miles

Data Sources:
USGS, National Geographic Maps, ESRI

Location 1
Location 2
Location 3
Location 4
Wasco
Moro
Ag Center
DeMoss Springs

Enlarged Area
Portland Metro Area
Salem

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Tuesday, February 5, 2008 8:33:30 AM
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Figure 20
Predicted Increases in Ambient Noise Levels at 1/4 Load

Golden Hills Wind Resource Area

Sherman County, OR

alternativenergy
Powered by BP

Ambient Noise Increase at 1/4 Load (dBA)

- 0 - 5
- 5.1 - 10
- 10.1 - 15
- 15.1 - 20
- 20.1 - 25
- 25.1 - 30

- Monitoring Microphone
- Turbine Location
- New Receptor Location
- Turbine Corridor
- House
- Abandoned House
- House, Not Involved

Transportation

- US / State Highway
- Major Road
- Local Road

Location 1
Location 2
Location 3
Location 4
Wasco
Moro
Ag Center
DeMoss Springs

Enlarged Area
Portland Metro Area
Salem

1:80,000
0 1 2 3
Miles

Data Sources:
USGS, National Geographic Maps, ESRI

TETRA TECH EC, INC.

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Figure 21
Predicted Increases in Ambient Noise Levels at Half Load

Golden Hills Wind Resource Area

Sherman County, OR

alternativeenergy
Powered by BP

Ambient Noise Increase at Half Load (dBA)

- 0 - 5
- 5.1 - 10
- 10.1 - 15
- 15.1 - 20
- 20.1 - 25
- 25.1 - 30

- Monitoring Microphone
- New Receptor Location
- Turbine Location
- House
- Abandoned House
- House, Not Involved
- Turbine Corridor

Transportation

- US / State Highway
- Major Road
- Local Road

1:80,000

0 1 2 3
Miles

Data Sources:
USGS, National Geographic Maps, ESRI

Location 1
Location 2
Location 3
Location 4
Wasco
Moro
Ag Center
DeMoss Springs

Enlarged Area
Portland Metro Area
Salem

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Friday, May 9, 2008 6:59:56 AM
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Figure 22
Predicted Increases in Ambient Noise Levels at 3/4 Load

Golden Hills Wind Resource Area

Sherman County, OR

alternativeenergy
Powered by BP

Ambient Noise Increase at 3/4 Load (dBA)

- 0 - 5
- 5.1 - 10
- 10.1 - 15
- 15.1 - 20
- 20.1 - 25
- 25.1 - 30

- Monitoring Microphone
- New Receptor Location
- Turbine Location
- House
- Abandoned House
- House, Not Involved
- Turbine Corridor

Transportation

- US / State Highway
- Major Road
- Local Road

1:80,000

0 1 2 3
Miles

Data Sources:
USGS, National Geographic Maps, ESRI

Location 1
Location 2
Location 3
Location 4
Wasco
Moro
Ag Center
DeMoss Springs
A
B
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D
E
F
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H
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Enlarged Area
Portland Metro Area
Salem

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Figure 23
Predicted Increases in Ambient Noise Levels at Full Load

BP Golden Hills Wind Resource Area

Sherman County, OR

alternativeenergy
Powered by BP

Ambient Noise Increase at Full Load (dBA)

- 0 - 5
- 5.1 - 10
- 10.1 - 15
- 15.1 - 20
- 20.1 - 25
- 25.1 - 30

- Monitoring Microphone
- New Receptor Location
- Turbine Location
- House
- Abandoned House
- House, Not Involved
- Turbine Corridor

Transportation

- US / State Highway
- Major Road
- Local Road

1:80,000

0 1 2 3
Miles

Data Sources:
USGS, National Geographic Maps, ESRI

TETRA TECH EC, INC.

Enlarged Area
Portland Metro Area
Salem

Table 6. Calculated Increases in Ambient Levels for Each Receptor

Receptor ID	Wind Turbine Load Level					Land Owner Involved or Not
	Cut-In dBA	Qtr Load dBA	Half Load dBA	¾ Load dBA	Full Load dBA	
# not inv > 10	**8**	**5**	**4**	**8**	**0**	
1	7.5	5.5	4.2	5.0	1.4	not
2	5.0	3.4	2.5	3.1	0.7	not
3	16.6	14.1	12.3	13.4	6.7	inv
4	16.9	14.4	12.5	13.7	6.9	inv
5	16.8	14.3	12.5	13.6	6.8	inv
6	10.8	8.5	6.9	7.9	2.8	inv
7	6.3	4.4	3.3	4.0	1.0	inv
8	3.9	2.5	1.8	2.2	0.5	inv
9	4.1	2.7	1.9	2.4	0.5	inv
10	1.9	1.1	0.8	1.0	0.2	inv
11	16.2	13.7	11.9	13.0	6.3	inv
12	10.2	8.0	6.4	7.4	2.5	not
13	11.1	8.7	7.1	8.1	2.9	not
14	8.3	6.2	4.8	5.7	1.7	not
15	10.2	7.0	5.0	5.5	1.1	inv
16	16.9	14.4	12.5	13.7	6.9	inv
17	18.8	15.0	12.5	13.1	5.0	inv
18	11.1	8.8	7.2	8.2	3.0	not
19	7.2	6.3	5.3	6.8	3.1	not
20	7.4	6.4	5.5	7.0	3.2	not
21	8.7	8.6	8.0	10.1	6.7	not
22	7.7	7.5	7.0	9.0	5.7	not
23	8.0	7.8	7.2	9.2	6.0	inv
24	8.0	7.9	7.3	9.3	6.0	inv
25	9.2	9.0	8.4	10.5	7.1	not
26	4.9	4.8	4.3	6.0	3.4	not
27	15.0	11.4	9.1	9.6	2.8	inv
28	7.4	7.2	6.7	8.6	5.5	inv
29	7.6	7.5	6.9	8.9	5.7	inv
30	7.7	7.5	7.0	9.0	5.7	inv
31	7.3	7.1	6.6	8.6	5.4	not
32	8.6	8.5	7.9	10.0	6.6	not
33	8.5	8.3	7.7	9.8	6.4	Not
34	14.4	13.2	12.0	13.9	8.7	inv
35	15.1	14.0	12.7	14.7	9.4	inv
36	15.1	14.0	12.7	14.7	9.4	not

Table 6. Calculated Increases in Ambient Levels for Each Receptor (Concluded)

Receptor ID	Wind Turbine Load Level					Land Owner Involved or Not
	Cut-In dBA	Qtr Load dBA	Half Load dBA	¾ Load dBA	Full Load dBA	
37	15.3	14.2	12.9	14.8	9.6	not
38	3.7	3.0	2.4	3.4	1.2	not
39	11.3	10.2	9.1	10.9	6.1	not
40	13.6	12.5	11.2	13.1	8.0	not
41	12.3	11.1	10.0	11.8	6.9	not
42	12.4	12.2	11.5	13.8	10.1	inv
44	9.4	9.2	8.6	10.8	7.3	inv
45	5.1	5.0	4.5	6.2	3.5	inv
46	17.1	13.4	11.0	11.5	3.9	inv
47	18.5	14.7	12.3	12.8	4.8	inv
48	18.9	15.1	12.6	13.2	5.0	inv
50	2.6	2.5	2.2	3.4	1.7	not
51	3.4	3.3	2.9	4.2	2.2	not
52	2.4	2.3	2.0	3.1	1.5	not
53	4.6	3.8	3.1	4.2	1.6	not
54	3.3	2.7	2.1	3.0	1.1	not
55	3.6	3.0	2.4	3.3	1.2	not
56	4.5	3.8	3.1	4.2	1.6	not
57	13.0	12.8	12.2	14.5	10.7	inv
58	2.2	2.1	1.8	2.8	1.3	not

A comparison was also made of the maximum predicted octave band levels at any residence with the ODEQ octave band limits presented in Table 2. Table 7 summarizes the information from Table 2, but includes two additional rows to show the maximum predicted levels and the difference from the standards levels. The octave band limits were equal to or less than the limits in all bands. Thus, the project is also expected to be in compliance with this element of the noise standards.

Table 7. State of Oregon Octave Band Limits Compared Against the Maximum Predicted Octave Band Noise Levels at any Residence

	Octave Band Center Frequencies								
Hertz (cycles per second)	31.5	63	125	250	500	1,000	2,000	4,000	8,000
ODEQ Nighttime Limit (dB)	65	62	56	50	46	43	40	37	34
Project Maximum Predicted Levels (dB)	n.a.*	62	55	50	46	38	26	0	0
Difference	n.a.	0	-1	0	0	-5	-14	-37	-34

* Sound Power Levels in the 31.5-Hz band are typically not reported for wind turbines.

5.0 SUMMARY

An ambient noise survey was conducted at four locations within the Project area to determine the levels of ambient noise (L_{50} in this case) that correlate with different wind speeds related to the full operating range of the turbines from cut-in to full load. These ambient L_{50} levels ranged from 18.8 to 43.7 dBA.

Computer modeling was performed to determine the turbine operational noise levels at five different loads ranging from cut-in to full load. The maximum predicted level at any residence was 47.1 dBA, which is below the 50 dBA limit established by the ODEQ. Thus, the Project is expected to be in compliance with this requirement.

The expected increases in ambient levels were determined by combining the modeled levels with the existing levels to determine the future noise levels with the Project in operation at the five different loads. Then the existing ambient levels were subtracted from the future level to determine the expected increases in the ambient levels. The predicted increases exceeded the 10 dBA increase specified in the ODEQ standard at eight residences that are not project participants. The maximum predicted increase was 15.3 dBA at cut-in load when the ambient noise levels are expected to be very low. The applicant will obtain written and signed waivers of this standard from the eight affected landowners. The Project will then be in compliance with this element of the standard.

The comparison of predicted octave band levels with the ODEQ octave band standards indicated that all the levels were either at or below the limits in all the bands. Thus, the project is also expected to be in compliance with this element of the standard.

Overall, it is anticipated that the Project will be in compliance with all aspects of the ODEQ noise standards applicable to wind farms.

6.0 REFERENCES

DataKustik GmbH, 2006. *Computer Aided Noise Abatement Model CadnaA*, Version .6. Munich, Germany.

ISO, 1993. International Organization for Standardization. Standard ISO 9613-2 *Acoustics – Attenuation of Sound During Propagation Outdoors, Part 2 General Method of Calculation.* Geneva, Switzerland.

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Golden Hills

GHIAPPDOC90

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: August 19, 2008

TO: Kelly O'Brien, BP Alternative Energy

FROM: Ethan Rosenthal

SUBJECT: **Addendum to Exhibit F**

PROJECT: Golden Hills Wind Project

PROJECT NO: BPOC0000-005

COPIES: File

Table F-1 of Section F.1 Property Ownership of the EFSC permit for the Golden Hills Wind Project has been updated to account for two new properties within the expanded project foot print. The new parcels are located interior to the prior foot print and therefore property ownership within 500 feet of the project has not changed:

Table F-1: Property Ownership Within Project Site

Landowners within the project		
Landowner Names	**Addresses**	
Betty Suzanne Alt, et al.	1050 Marian Drive	Homer, NY 13077
Karl F. Amidon, et al.	202 Knight Road	Goldendale, WA 98620
Leland Anderson	3445 Dogwood Drive S	Salem, OR 97302
Stanley Anderson	10630 SE Clay #403	Portland, OR 97216
Bruce Andrews, Trustee	8563 SE Kane Road	Gresham, OR 97080
Scott Blau	314 2nd Street	Lake Oswego, OR 97034
Orville and Shirley Blaylock	68808 Hwy 97	Moro, OR 97039
Keith Blaylock	68779 Van Gilder Road	Wasco, OR 97065
Kevin Bonness	2643 Turnstone Drive	Pleasonton, CA 94566-5341
Sandra Bredeson	34005 Mallard Avenu	Nehalem, OR 97131
Steven F. Burnet, Trustee	94699 Monkland Road	Moro, OR 97039
Bon Christianson	10505 N Sage Hollow Way	Boise, ID 83714-9575
Larry Clark	131 Canyon Gate Lane	Selah, WA 98942
Marilyn Clark	1502 W Eugene Street	Hood River, OR 97031
Marilyn Jane Clark	8395 SW 88th	Portland, OR 97223
John and Carolyn DeMoss	70620 Hwy 97	Moro, OR 97039
James Dunn and David Dunn	9695 Lower Bridge	Terrebonne, OR 97760
John and Nancy Fields	75960 Hwy 97	Wasco, OR 97065

Michael Foss	23826 SE 47th Place	Issaquah, WA 98029
Alan Hart	3989 Viewcrest Drive S	Salem, OR 97302
Darryl Hart	63461 Fraser Road	Moro, OR 97039
Kenneth Hart, Trustee	63461 Fraser Road	Moro, OR 97039
Jean McIntyre Joyce, et al.	1047 Lucky Lane	Ontario, OR 97914
Jo Anne Kock	1817 Feather Way	Las Vegas, NV 89108
Sandra Loop	3302 Royal Crest Drive	The Dalles, OR 97058
Carole Makinster Living Trust	P O Box 353	Moro, OR 97039
Patricia Malen	9030 NE 33rd Street	Yarrow Point, WA 98004
L. P. McClennan	P O Box 215	Wasco, OR 97065
Thomas and Nancy McCoy	93340 Hwy 206	Wasco, OR 97065
Wendy McDermid Parker	27640 Powerline Road	Halsey, OR 97349
McIntyre Farm Partnership	1047 Lucky Lane	Ontario, OR 97914
Myrna L. Melzer	P O Box 342	Moro, OR 97039
Nancy Pema	3688 Augusta National Drive S	Salem, OR 97302
Forest A. Peters, Trustee	69420 N Sawtooth Road	Wasco, OR 97065
Sara Petersen	15081 SE 126th Avenue	Clackamas, OR 97015
Mary Ann Pilgreen	P O Box 336	Helix, OR 97835
Allan Pinkerton	5002 Airport Road	Pendleton, OR 97801-4586
Bruce Pinkerton	P O Box 312	Moro, OR 97039
Dave Pinkerton	P O Box 302	Moro, OR 97039
Janet Pinkerton	P O Box 312	Moro, OR 97039
Margaret Pinkerton	P O Box 343	Moro, OR 97039
Judith Probstfield	13315 West Prospect Drive	Sun City West, AZ 85375
Theron Richelderfer	P O Box 93	Wasco, OR 97065
Martin Richelderfer	P O Box 113	Wasco, OR 97065
Sylvia Rogers	2010 SW Nancy Drive	Gresham, OR 97080
John P. Shipley	P O Box 162	Moro, OR 97039
Michael Sigman	37211 Floral Creek Circle	Murietta, CA 92562
Phyllis Sisco	P O Box 62	Beaver, OR 97108
Frances Diane Stewart	20806 Saratoga Road	Sonora, CA 95370-5423
Carole Thompson Peake	P O Box 353	Moro, OR 97039
Paula Thompson, c/o UMESD	2001 SW Nye	Pendleton, OR 97801
Ken Thompson		
Ronald D. Thompson	66351 Hay Canyon Road	Moro, OR 97039
Donald Thompson, Trustee	96845 Monkland Lane	Moro, OR 97039
U.S. Nat' Bank of Or. Trustee	428 W. Riverside Avenue,	Spokane, WA 99201
May Bamum Trust, c/o Farm,	Suite 700	
Ranch & Timber Asset Mngmt.		
Arthur A. & Marjorie E. Van Gilder	P O Box 275	Wasco, OR 97065
Raymond E. & Vera M. Van Gilder	512 Yates Street	Wasco, OR 97065
Phyllis K. Ullman	2833 NE 89th Avenue	Portland, OR 97220
James Walker	15819 NE 43rd	Vancouver, WA 98682
Leslie Wick	6825 SW Thunderbird Court	Redmond, OR 97756
Allison M. Yamauchi	4900 Crestwood Drive	Little Rock, AR 72207
Linda Quinlan	2055 S 6th St	Cottage Grove, OR 97424

Lavelle L. Schilling, Trustee	1147 Dublin Lane	Cottage Grove, OR 97424
Donald Fordyce	PO Box 154	Friday Harbor, WA 98250
Robert Fordyce	226 E Saguaro Dr	Florence, AZ 85232
Keith Blau	23870 SW Scott Ridge Terrace	Sherwood, OR 97140
Craig Blau	688 E Vereda Sur	Palm Springs, CA 92262
James Larimore	PO Box 81	Beaver, OR 97108
Judith Larimore	1197 Century Dr., #31	Albany, OR 97321
Phyllis Sisco	PO Box 62	Beaver, OR 97108
Susan Larimore	PO Box 202	Netarts, OR 97143
Faye Miller	22750 Borba Rd	Beaver, OR 97108

Landowners within 500 feet		
Landowner Names	**Addresses**	
Tom and Georgia Macnab	66330 Henrichs Road	Moro, OR 97039
Helen Martin	3325 Columbia View Dr E	The Dalles, OR 97058
James and Jerrine Belshe	500 Sandon Street	Wasco, OR 97065
Larry and Carol Thompson	66680 Fairview Rd.	Moro, OR 97039
Weedman Ranches, Inc.	P.O. Box 386	Wasco, OR 97065
Edith Luetta Shull, Et.Al.	P.O. Box 171	Wasco, OR 97065
Patrick A. Powell	7580 SW Fulton Pk. Blvd.	Portland, OR 97219
Norma M. Barzee	790 SE Webber Unit 102	Portland, OR 97202
Sharon A Rolfe, Et.Al.	414 NW 214th Circle	Ridgefield, WA 98642
Peter J. Macnab, Trustee	608 Yates	Wasco, OR 97065
Terry and Diane Kaseberg	93431 Hwy 206	Wasco, OR 97065
Lee and Karen Kaseberg	70031 Van Gilder Rd.	Wasco, OR 97065
Thomas and Nancy McCoy	93340 Hwy 206	Wasco, OR 97065
Gary L. VanGilder	68192 Petes Road	Wasco, OR 97065
Mike and Jeanney McArthur	93350 Foss Lane	Wasco, OR 97065
Kevin and Paticia Kaseberg		Wasco, OR 97065
Steven and Deeann Kaseberg	92883 Locust Grove Lane	Wasco, OR 97065
Particia Mae Welk	2880 NW Melville Dr.	Bend, OR 97701
Richard D. & Jean H. McGregor	10242 SE Walnut Drive	Portland, OR 97266
The Barnett EST Partnership	P O Box 273	Wasco, OR 97065
Martin Bros.	73362 Greenbury Rd.,	Rufus, OR 97050
Don and Jena Hilderbrand	PO Box 148	Wasco, OR 97065
Norma M. Barzee	790 SE Webber Unit 102	Portland, OR 97202
James R. and Jerrine Belshe, Trustee	P O Box 327	Wasco, OR 97065
Douglas R. Bish	P O Box 13	Wasco, OR 97065
Geraldine Carroll, et al.	77402 Desert Road	Hermiston, OR 97838
Reatha S. Coats	P O Box 45	Wasco, OR 97065
Gloria F. Cockburn, et al.	10776 SE Idleman Road	Portland, OR 97266
Denice C. Davies, ET VIR	1611 NE Gertz Road	Portland, OR 97211

James Fulton Trust / Farm, Ranch & Timber Asset Management	428 W. Riverside Avenue, Suite 700	Spokane, WA 99201
Georgie Belle Holzapfel	77402 Desert Road	Hermiston, OR 97838
Irwin Mortgage Group	10500 Kincaid Drive	Fishers, IN 46038
Justesen Ranches	P O Box 2	Kent, OR 97033
J. Kenneth Kaseberg, GST Trust	1670 Edgewood Drive	Palo Alto, CA 94303
Lee and Karen Kaseberg	70031 Van Gilder Road	Wasco, OR 97065
Lee C. and Terry D. Kaseberg	70031 Van Gilder Road	Wasco, OR 97065
Peter J. Macnab, Trustee	708 Yates	Wasco, OR 97065
Tom and Georgia Macnab	66330 Henrichs Road	Moro, OR 97039
Terry and Diane Kaseberg	93431 Hwy 206	Wasco, OR 97065
Martin Brothers Land	P O Box 128	Rufus, OR 97050
Patrick K. Martin	5343 Ayres Way	The Dalles, OR 97058
Mike and Jeanney McArthur	93350 Foss Lane	Wasco, OR 97065
Dean C. & Jancie K. Monroe	P O Box 87	Moro, OR 97039
Morrow County Grain Growers	P O Box 367	Lexington, OR 97839
Philip G. and William P. O'Meara	P O Box 1141	Redmond, OR 97756
Richelderfer-Bish c/o Dougals R. Bish	P O Box 13	Wasco, OR 97065
Diane E. Poston	P O Box 370	Moro, OR 97039
Patrick A. and Kathleen A. Powell	7580 SW Fulton Park Blvd	Portland, OR 97219
Keith and Christine Rice Trust / c/o Farm, Ranch & Timber Asset Management	428 W. Riverside Avenue, Suite 700	Spokane, WA 99201
Sharon A. Rolfe, et al.	414 NW 214th Circle	Ridgefield, WA 98642
H. C. Sanderson	91608 Biggs-Rufus Hwy.	Wasco, OR 97065
R. Gary Shelton, et al.	P O Box 311	Moro, OR 97039
Brad and Donna Lohrey	PO Box 34	Wasco, OR 97065
Edith Luetta Shull, et al.	P O Box 171	Wasco, OR 97065
Nancy J. Simpson	P O Box 370	Wasco, OR 97065
Larry and Sherry Kaseberg	69384 Wheatacres Road	Wasco, OR 97065
Patricia A. Skiles	504 Veterans Drive	The Dalles, OR 97058
Delmer A. and Margaret Smith	7611 Evergreen Road	Richland Hills, TX 76118
Debbie Spitzer	3405 Riverknoll Way	West Linn, OR 97068
Elizabeth Thomas, Trustee	3564 East 2nd Street #61	The Dalles, OR 97058
Gary L Van Gilder	68192 Petes Road	Wasco, OR 97065
Beth L. Webb	P O Box 97	Moro, OR 97039
Patricia Mae Welk	2880 NW Melville Drive	Bend, OR 97701
Donald Richelderfer	PO Box 354	Wasco, OR 97065
Betsy Martin	98573 Bruckert Lane	Moro, OR 97039
Daniel Richelderfer	75103 Hwy 97	Wasco, OR 97065
Dee Arthur Richelderfer	PO Box 175	Wasco, OR 97065
D'Ann Massie	14132 Dodson Road North	Ephrata, WA 98823
D'Lynn Marie Richelderfer	29916 34th Ave. S.	Auburn, WA 98001

Jon Richelderfer, Leesa Scrivner, Karl & Angela Richelderfer Irrevocable Trust	PO Box 1424	The Dalles, OR 97058
David Thomas Richelderfer	37 West Cedar	Hermiston, OR 97838
Richard Richelderfer	PO Box 261	Wasco, OR 97065
Dougals R. Bish	P O Box 13	Wasco, OR 97065
Ivan Gunnels	408 Columbus St	Moro, OR 97039
Mid Columbia Producers, Inc.	P O Box 344	Moro, OR 97039
Oregon Department of Transportation	355 Capitol Street NE, Room 434	Salem, OR 97301-3871

Initials: kaki
File Name:
Project Number: POCB0005