Supplement to the Montague Wind Power Facility Application for Site Certificate

Gilliam County, Oregon

Prepared for

Oregon Department of Energy

March 2015

Prepared by

Iberdrola Renewables, Inc.

CH2M HILL

Northwest Wildlife Consultants

Printed on Recycled and Recyclable Paper

Contents

Attachments

EXHIBIT A

Applicant Information

Email of April 14, 2010, with Articles of Incorporation

Attachment A-1 contains the articles of organization for Montague Wind Power Facility, LLC. The LLC is a single-member-managed entity. Iberdrola Renewables, Inc., will own 100 percent of the membership interests.

EXHIBIT B

General Information About the Proposed Facility

Informal RAIs (Responses dated March 12, 2010)

Informal RAI Comment

B-9 describes 91 miles of collector; B-16 says the maximum length of collector is 76 miles. What is the correct maximum length of the collector system?

Response

The maximum length of the collector line depends on whether the overhead collector line is factored in. The maximum length of the underground collector line alone is 76 miles. The maximum length of the 34.5-kV collector system is 103 miles (76 miles of underground cables and 27 miles of aboveground lines).

Based on the preliminary layout, 76 miles of collector cables will be placed underground and 15 miles will run on overhead pole structures, for a total of 91 miles. However, as explained on pages B-9 and B-10, it may be necessary to place more of the collector lines currently shown as underground lines on aboveground structures due to site-specific conditions, resulting in more than 15 miles of aboveground collector lines. In order for the Department to evaluate the potential impact of aboveground collector cables, IBR proposed that no more than 27 miles, or 30 percent of the collector system as currently designed, be installed above ground; 30 percent of 91 miles is approximately 27 miles.

The statement on page B-16 is incorrect. It should read: "Under the worst-case scenario, the maximum length of the underground 34.5-kV collector cables will be approximately 76 miles."

Informal RAI Comment

B-9 describes the support structures for aboveground collector lines as "about 80 to 100 feet tall." B-17 describes the structures as having a total height of "approximately 56 feet." AA-2 describes the structures as up to 100 feet tall. What is the correct maximum height of these structures?

Response

The maximum height for the aboveground collector line support structures is 100 feet.

Informal RAI Comment

What is the maximum length of the SCADA lines? What is the maximum length of SCADA lines aboveground? Given that some of the collector line would be double circuit, would the SCADA lines on those segments be single lines (and thus, the overall length of SCADA would be less than the overall length of collector)?

Response

The maximum length of the total SCADA lines is 129 miles, as detailed below:

Length of the underground collector lines (76 miles)

+

Length of the maximum 30% overhead collector lines (measured as a single line of poles) (27 miles)

+

Length of 230-kV overhead lines (measured as a single line of poles) (the "home run" will have two SCADA lines and is counted twice) (26 miles)

= 129 miles.

The maximum length of the aboveground SCADA lines is 53 miles. This is equal to the total length described above minus the length of underground collectors (129 miles minus 76 miles) or 27 miles + 26 miles for a total of 53 miles.

The aboveground SCADA lines will be single lines on the double-circuit collector lines. Therefore, the overall length of aboveground SCADA will be less than the overall length of the aboveground 34.5-kV collector system combined with the 230-kV line.

Informal RAI Comment

B-10 says that there would be a "maximum of 34 junction boxes," but it also says there would be 5 junction boxes for every 10 turbines. This would mean up to 135 junction boxes for 269 turbines. Table W-1 says there would be 54 junction boxes. What is the correct maximum number?

Response

The correct maximum number of junction boxes is 54.

Informal RAI Comment

B-5 says that turbine foundations would have a maximum of 41 cubic yards of concrete above 3 feet below grade; the total cubic yards in Table W-1 represents 46.7 cubic yards per turbine and the total cubic yards in Table W-2 represents 55.5 cubic yards per turbine. What is the correct maximum volume of concrete in foundations (above 3 feet below grade) for the 1.5-MW turbines and for the 3.0-MW turbines? (For now, we are assuming that site

restoration would require removal to 3 feet, but we plan to discuss this issue further with Jordan Maley to make sure that we correctly understand his letter).

Response

The concrete quantities listed in Exhibit B were calculated based on the assumption that concrete from the pedestal would be 0.5 feet above grade. The concrete quantities listed in Exhibit W were calculated based on the assumption that the concrete pedestal would be 1.0 feet above grade.

The correct concrete quantities are presented in Table W-1 and Table W-2.

The maximum volume of concrete in foundations (above 3 feet below grade) for the 1.5-MW turbine is 37.7 cubic yards. The maximum volume of concrete in foundations (above 3 feet below grade) for the 3.0-MW turbine is 46.5 cubic yards. In addition, approximately 9 cubic yards of concrete will be used to construct the transformer foundation at each turbine location. For Table W-1 the total concrete volume is 46.7 cubic yards, which is 37.7 cubic yards (foundation) + 9 cubic yards (transformer pad). Table W-2 shows a total concrete volume of 55.5 cubic yards, which is 46.5 cubic yards (foundation) + 9 cubic yards (transformer pad).

Informal RAI Comment

What type of met tower structures would be used (monopoles or lattice towers)?

Response

The met towers will be lattice structures.

Informal RAI Comment

Describe the lines and supports needed to supply electric and telephone service to the O&M buildings.

Response

Electric and telephone service will be delivered to the O&M building on a typical single-pole wood structure, similar to electric and telephone service to local residences.

RAI No. 1 (Responses dated March 29, 2010)

Comment B1

IBR requests "the flexibility to construct two turbine strings that were included in the LJF RfA as part of the Montague Wind Power Facility, if they are not constructed as part of the LJF." The application refers to Figure C-3, which shows the overlap of the LJII facility within the proposed MWPF site boundary. The map, however, does not identify the potentially affected LJII turbines that might become part of the MWPF. To better illustrate the flexibility

that IBR is requesting, provide a map based on Figure 2 in the LJII Request for Amendment #1 showing the proposed overlap of the MWPF within the site boundary of LJII.

Response to B1

Figure C-3a (Attachment B-1) shows the proposed overlap of the Montague Wind Power Facility (Facility) with the site boundary of Leaning Juniper II (LJII). The map illustrates by turbine ID number the LJII turbines that potentially could be built as part of the Facility.

Comment B2

The application describes the support structures for aboveground collector line as "wood or steel two-pole H-frame or wood or steel monopole support structures." Where aboveground transmission lines turn a corner, special tangent or corner structures may be needed. Removal of these structures during site restoration may be more costly than removal of the H-frame or monopole structures. Provide a description of the tangent or corner structures that would be used and estimate the maximum number of such structures that would be used in the "worst case."

Response to B2

The tangent or corner turning structures will consist of self-supporting steel or guyed wood. The self-supporting steel and guy anchors will require shallow concrete foundations. The cost for removal of the concrete foundations will be a minimal increase over the cost for removal of a typical overhead H-frame or monopole structure. The worst-case scenario would be 60 guyed or self-supporting steel turning structures. The worst-case scenario for the H-frame and single-pole transmission line turning structures is summarized below.

The H-Frame transmission line (wood or steel) in a lateral or straight configuration uses two poles with direct embedded foundations. The foundations consist of auger holes approximately 5 feet in diameter and 12 feet in depth that are backfilled with concrete slurry. The H-frame turning structure uses three poles with the same embedded foundation for each pole as the lateral configuration and additional guy lines for support. Guy lines are used in a 1 to 1 ratio for each conductor and shield wire in each direction of the turn. In a 90-degree turning structure, each pole will support one conductor and the two outside poles will also support one shield wire. There will be one guy wire for each conductor and shield wire parallel to the incoming direction and one guy wire for each conductor and shield wire parallel to the outgoing direction. In the typical H-frame turning structure, there will be 10 guy wires supporting the three-pole structure. Each guy wire is anchored using a power screw approximately 17 feet in length. These screws do not require concrete.

The single-pole transmission line in a lateral configuration uses a steel pole approximately 5 feet in diameter at the base and a concrete foundation 6 feet in diameter and 20 feet in depth. The single-pole turning structure uses a steel pole 7 feet in diameter at the base and a concrete foundation 8 feet in diameter and 35 feet in depth.

Email Response of April 20, 2010: Soil Protection Standard

Comment

We were expecting that IBR would respond to RAI G1 by providing a revised Table G-1 showing the quantities of materials "flowing into and out of" the proposed facility during operation over the life of the facility (or on a per-year basis). We are concerned about large quantities of the potentially hazardous materials on-site such as mineral oils, synthetic oils and ethylene glycol. Issues of concern are proper storage, proper handling to avoid spills and soil contamination, and proper disposal.

From the information IBR has provided, we cannot determine the quantities of these materials that would be on-site at any one time (in turbines or at the O&M facilities) nor the quantities that would need to be properly disposed of on an annual basis. For example, Table G-1 says that 10 gallons per turbine of synthetic oil would be stored in the O&M facilities (for use in turbines as needed). If 269 turbines are built, this implies that storage for approximately 2,700 gallons of oil would be needed. In Exhibit B, IBR states that "lubricants, oils, grease, antifreeze, degreasers, and hydraulic fluids" would be stored at the O&M facilities "in approved containers located aboveground," but IBR does not describe the "containers." In addition, IBR has not estimated the quantity of used "lubricants, oils, greases, antifreeze, cleaners, degreasers, or hydraulic fluids being held for delivery to a certified recycling transporter" that would be stored temporarily in the O&M facilities, and IBR has not described the storage methods for these materials. The response to RAI G1 states that turbines would receive at least an annual oil-change but does not give the quantity of used oil that would be drained from each turbine annually.

In RAI W1, we requested the quantity of oil contained in each turbine. Because IBR has requested a range of possible turbine types, we asked for the maximum amount in each turbine. IBR's response states that "the maximum amount of oil contained in the turbines proposed at the Montague Facility ranges from 83 to 304 gallons." We do not think that IBR intended to say that there would be 83 to 304 gallons in each turbine, but we are uncertain how to calculate a maximum per turbine amount given the information provided.

In Exhibit B, IBR states that "the production, use, storage, transport, and disposal of hazardous materials associated with the proposed Facility will be in strict accordance with federal, state, and local government regulations and guidelines," but no applicable regulations and guidelines are discussed. To better understand the potential soil contamination risk, we request that IBR estimate the quantities of mineral oils, synthetic oils and ethylene glycol that would need to be properly disposed of on an annual basis. We request that IBR provide a more complete description of the proposed on-site storage containers and containment areas for both unused and used mineral oils, synthetic oils and ethylene glycol.

Response

Each site has a Spill Prevention Control and Countermeasures (SPCC) plan, as required by 40 CFR 112. The plan has been designed specifically to each site. Each SPCC plan aids in the prevention and containment of oils and hazardous substances. New oil product is

contained in DOT approved containers for which they were shipped, including the manufacturers label and stored on/in secondary containment inside the O&M building.

Although each turbine varies in the amount of oil it contains during operations (from 83 up to 304 gallons), the throughput of the oil and ethylene glycol is very little. On a quarterly maximum average, each O&M building stores approximately 330 gallons of new oil and about equal amounts of waste oil. The waste oil is commingled (hydraulic oil & gear oil). The total estimated amount of annual through-put is between 1,350 and 2,500 gallons of oil, with the larger percentage being gear oil. Every 2 years, applicable sites might go through a 55 gallon drum of ethylene glycol.

The sites do not store mineral oil. Mineral oil is only found in the substation transformers and the GSU transformers. If oil in a transformer needs to be changed, the service is contracted-out and the vendor typically manages the oil. These transformers and their secondary containment requirements are describe in the site-specific SPCC.

The Hazardous Substance Survey is filed annually, as required by ORS 453.307 – 453.414. The survey includes the quantities of oil and the storage locations in addition to any other hazardous substance that we would be required to report. To date, that report includes the following: mineral oil, hydraulic oil, gear oil, and antifreeze.

Finally, under 40 CFR 261 we qualify as a Conditionally Exempt Small Quantity Generator (CESQG) of Hazardous waste and we manage our hazardous waste accordingly.

Email Response of April 20, 2010: Corner Turning Structures (Tangents) for Transmission Lines

Comment 1a

RAI B2 requested information about tangent or corner turning structures for transmission lines. While I was considering IBR's response, I realized that the phrasing of the request was ambiguous. RAI B2 begins by noting that the application describes the support structures for "collector lines." However, the RAI requests information regarding the types of structures and the maximum number of structures for the facility's "transmission" lines. IBR's response describes two types of tangent structures and states that "worst-case" there would be 60 such structures. It is unclear whether IBR's response was describing the 34.5-kV transmission lines (collector lines) or the 230-kV transmission lines, or both. To clarify this for us, can you get answers to the following:

a. Do the two types of tangent structures described in IBR's March 29 response apply to 34.5-kV lines? If not, please provide a description of the tangent structures that would be used for 34.5-kV lines. Please include, specifically, a description of the concrete foundations (so that we can calculate cubic yards).

Response

The two types of turning structures described in IBR's March 29 response did not apply to 34.5kV transmission lines. A description of the 34.5kV turning structure is provided below.

Single and double circuit 34.5kV transmission lines in a linear configuration use a single, typically wood, pole structure with a direct embedded foundation. In a turning configuration, each circuit is independently supported by the same single pole structure and direct embedded foundation that is used in the linear configuration. The single pole 34.5kV turning structure also utilizes guy lines for additional support.

The typical wood singe pole is 12–15 inches in diameter. The associated direct embedded foundation is typically 20-24 inches in diameter and 10 -11 feet in depth. The excavated foundation is primarily filled with the support pole itself. The remaining void is backfilled with the excavated soil and compacted as necessary. Unlike the 230kV single pole direct embedded foundation, non-structural, concrete slurry is almost never used as backfill for 34.5kV direct embedded foundations. This direct embedded foundation design is used for both the linear and turning 34.5kV structures. The only difference being that a single pole and foundation are used to support each circuit independently in a turning structure. Each turning structure will also have associated guy lines for added support. Guy lines are used in a 1-to-1 ratio for each conductor and shield wire in each direction of the turn. In a 90 degree turning structure, each pole will support three conductors and one shield wire. There will be one guy wire for each conductor and shield wire parallel to the incoming direction and one guy wire for each conductor and shield wire parallel to the outgoing direction. In the typical 34.5kV turning structure, there will be 8 guy wires supporting each single circuit, single pole structure. Each guy wire is anchored using a power screw approximately 17 feet in length. These screws do not require concrete.

Comment 1b

b. Do the two types of tangent structures described in IBR's March 29 response apply to 230-kV lines? If not, please provide a description of the tangent structures that would be used for 230-kV lines. Please include, specifically, a description of the concrete foundations (so that we can calculate cubic yards).

Response

The two types of turning structures described in IBR's March 29 response apply to those used for 230kV transmission lines. Clarified descriptions of the H-Frame and Monopole 230kV turning structures are provided below.

The 230kV H-frame transmission line (wood or steel) in a linear or straight configuration uses two poles, each approximately 2-2.5 feet in diameter at the base, and direct embedded foundations. Direct embedded foundations are excavated holes filled primarily with the support poles themselves and backfilled with associated soil or non-structural concrete slurry. Concrete slurry is typically used when the associated soil cannot be sufficiently compacted due to foundation depth or soil properties. Linear 230kV H-frame foundations are approximately 5 feet in diameter and 12 feet in depth. The H-frame turning structure uses three poles and the same direct embedded foundation as the lateral configuration with additional guy lines on each pole for additional support. Guy lines are used in a 1 to 1 ratio for each conductor and shield wire in each direction of the turn. In a 90-degree turning structure, each pole will support one conductor and the two outside poles will also support one shield wire. There will be one guy wire for each conductor and shield wire parallel to

the incoming direction and one guy wire for each conductor and shield wire parallel to the outgoing direction. In the typical H-frame turning structure, there will be 10 guy wires supporting the three-pole structure. Each guy wire is anchored using a power screw approximately 17 feet in length. These screws do not require concrete.

The single-pole transmission line in a linear configuration uses a steel pole approximately 5 feet in diameter at the base and a direct embedded foundation 6 feet in diameter and 20 feet in depth. The single-pole turning structure uses a steel pole 7 feet in diameter at the base and a direct embedded foundation 8 feet in diameter and 35 feet in depth. The direct embedded foundations used for steel single-pole transmission lines typically use non-structural concrete slurry as backfill.

Comment 1c

c. What is the maximum ("worst-case") number of tangent structures for 34.5-kV lines and what is the maximum number for 230-kV lines?

Response

The maximum number of turning structures for the proposed Montague Facility by voltage:

34.5kV maximum turning structures = 72

230kV maximum turning structures = 25

Comment 1d

d. We assume that tangent structures would replace regular support structures and would not be additional. Is that correct? For example, suppose 60 tangent structures are needed for the 34.5-kV lines, would that reduce the number of standard support structures for the 34.5-kV lines shown in Table C-2 (so that there would be 660 standard structures + 60 tangent structures)? Or, would the tangent structures be additional (720 standard structures + 60 tangent structures)? In other words, we need to know the maximum number of standard structures and the maximum number of tangent structures for each type of transmission line (34.5-kV lines and 230-kV lines).

Response

ODOE is correct in assuming that turning structures will replace standard structures and will not be additive to the estimated total structures included in Table C-2.

The total number of overhead 34.5kV structures is 720. Of these 720 structures, a maximum of 72 are expected to be turning structures.

The total number of overhead 230kV structures is 179. Of these 179 structures, a maximum of 25 are expected to be turning structures.

EXHIBIT C

Proposed Location and Maps

Informal RAI (Responses dated March 12, 2010)

Informal RAI Comment

Provide Tables C-2 and C-3 in Excel format.

Response

Response e-mailed to John White/ODOE and Kara Warner/Golder on March 5, 2010, with Excel versions of Tables C-2 and C-3 (see Attachment C-1).

Informal RAI Comment

Figures C-6 and C-7: Discussed at the meeting on 2/25. The maps are missing collector lines, access roads and staging areas for the 3.0-MW layout. IBR noted that the 3.0-MW layout provided in the LJII Request for Amendment #1 also did not show these components. We requested updated Figures C-6 and C-7.

Response

Response e-mailed to John White/ODOE and Kara Warner/Golder on March 5, 2010, with updated Figures C-6 and C-7 (see Attachment C-1).

EXHIBIT E

Permits Needed for Construction and Operation

RAI No. 1 (Responses dated March 29, 2010)

Comment E1

If a private water source (new or existing well) is used during construction (rather than the City of Arlington), would that source be a related or supporting facility? If the limited water use license is to be obtained by a third party, what facts support the conclusions that the third party has a "reasonable likelihood" of obtaining the permit and that IBR has a "reasonable likelihood" of getting an agreement with the third-party for access to the water?

Response to E1

If a private water source (new or existing well) is used during construction (rather than the City of Arlington), that source would not be a related or supporting facility because it would be used by multiple projects and County needs and would not be "but for" the Facility.

Comment E2

Gravel and washed rock would be "acquired by the construction contractor from existing or new commercial gravel pit sources." Do sources currently exist that could supply all the gravel and rock needed? If a new quarry would have to be developed to supply rock and gravel, would the quarry be a related or supporting facility? If the permits needed to open a new quarry are to be obtained by a third party, what facts support the conclusions that the third party has a "reasonable likelihood" of obtaining the permits and that IBR has a "reasonable likelihood" of getting an agreement with the third-party for access to the gravel and rock needed for construction of the facility?

Response to E2

Yes, there are existing aggregate sources in the region that can provide all the gravel for the Facility. If a new quarry must be developed, the source would not be a related or supporting facility because it would be used by multiple projects and County needs and would not be "but for" the Facility.

Comment E3

If a new or existing concrete batch plant is used, would the batch plant be a related or supporting facility? If the permits needed to construct and operate a new batch plant are to be obtained by a third party, what facts support the conclusions that the third party has a "reasonable likelihood" of obtaining the permits and that IBR has a "reasonable likelihood" of getting an agreement with the third-party for access to the concrete needed for construction of the facility?

Response to E3

If a new or existing concrete batch plant is used, that source would not be a related or supporting facility because it would be used by multiple projects and County needs and would not be "but for" the Facility.

EXHIBIT F

Property Ownership

Informal RAI (Response dated March 12, 2010)

Informal RAI Comment

Provide a list of the names and mailing addresses of all Morrow County property owners within 500 feet of the site boundary.

Response

Response e-mailed to John White/ODOE and Kara Warner/Golder on March 5, 2010, with Table F-2, Morrow County Landowners within 500 feet of Proposed Site Boundary (see Attachment F-1).

EXHIBIT G

Material Analysis

RAI No. 1 (Responses dated March 29, 2010)

Comment G1

Exhibit G calls for a materials analysis including an inventory of substantial quantities of industrial materials flowing into and out of the proposed facility during construction and operation. Table G-1 lists materials under the heading "Operations and Maintenance" but does not address the quantities "flowing into and out of" the proposed facility over the life of the facility (or on a per-year basis). Describe the disposal of used oils, antifreeze and the ultimate disposition of other materials listed in the table under "Operations and Maintenance".

Response to G1

Spent (used) oils, lubricants, and antifreeze are generated as part of ongoing preventative maintenance on an as-needed basis. Turbines receive at least an annual oil change. Spent products are collected by a subcontractor and disposed of or recycled offsite at a licensed facility. The total disposal will be limited to the amount of material stored onsite, as spent material will be replaced with new material.

Informal RAI

B-7 says that herbicides would not be stored on-site; on page G-5 and in Table G-1, IBR says that pesticides would be stored in the O&M buildings. Is B-7 incorrect?

Response

IBR will subcontract out all weed control work and therefore will not store any herbicides onsite. B-7 is correct and Table G-1 incorrectly states that the "ultimate disposition" of Round-up and 2,4-D is "stored in O&M building(s)".

EXHIBIT K

Land Use

Informal RAIs (Responses dated March 12, 2010)

Informal RAI Comment

K-4 says there would be impacts to 222 acres of agricultural land. Table C-2 shows 237.3 acres; Table P-10 and P-11 show 220 acres. What is the correct number?

Response

The acres calculated for Table C-2 are greater than the acres calculated for Exhibits K and P because the calculations are tabular and therefore account for overlap/double counting. P-10 is less than C-2 because GIS removes overlap of permanent and temporary facilities. P-10 and P-11 are slightly different because for P-11 a worst-case layout is used. K-4 is more than P-11 because for P-11 acreage that GIS technically shows as an impact in Cat 1 habitat was removed. In summary, the differences in the calculations result from differences between GIS analyses and tabular calculations. To be conservative, a maximum of 237.3 acres could be used.

Informal RAI Comment

K-5 says that the facility complies with the applicable substantive criteria; K-22 says that the facility does not comply with GCDO Section 7.020(T)(4)(a)(10). The discussion at page K-33 implies that the facility also does not comply with GCDO Section 4.020(D)(14). Is K-5 incorrect?

Response

GCDO 4.020(D)(14) authorizes a commercial utility facility in the EFU base zone subject to conditional use review. GCDP 4.020(D)(14), however, states that a facility may not preclude more than 20 acres of non-high-value farmland from commercial agricultural enterprise, but GCDO 7.020(T)(4)(a)(10) provides that a wind energy facility is allowed on EFU land even if it exceeds 20 acres of non-high-value farmland subject to a Goal 3 exception. Therefore, given that the Facility will permanently impact more than 20 acres of non-high-value farmland soils, the Facility complies with all applicable substantive criteria subject to a Goal 3 exception under GCDO.

Informal RAI Comment

The ordinance (GCZO Section 7.020(T)(4)(a)(8)) requires a weed control plan addressing "preparation, construction, operation and demolition/rehabilitation." IBR proposes a Revegetation Plan similar to the one adopted for LJII. That plan, however, does not address

weed control during operation. Would IBR agree to a condition similar to Helix Condition 44?

Response

Response e-mailed to John White/ODOE and Kara Warner/Golder on March 5, 2010: IBR would agree to a condition similar to Helix Condition 44.

Informal RAI Comment

GCCP Part 2, Policy 6 addresses erosion control. The application discusses erosion control during construction and revegetation, but not during operation. Would IBR agree to a condition similar to Helix Condition 82 and LJII Condition 75?

Response

Response e-mailed to John White/ODOE and Kara Warner/Golder on March 5, 2010: IBR would agree to a condition similar to Helix Condition 82 and LJII Condition 75.

RAI No. 1 (Responses dated March 29, 2010)

Comment K1

Construction of the facility would take approximately 85 acres of cropland out of production (Table P-10). Explain why this loss of production would not result in a significant increase in the cost of accepted farming practices.

Response to K1

GCDO 4.020(H) provides the specific review criteria for conditional uses in the EFU zone, and as the County directed, IBR has addressed the review criteria in Section K.5.1.2 of Exhibit K. Specifically, the analysis demonstrating that the Facility will result in no significant change in accepted farming practices, or significantly increase the cost of farming practices, is discussed on pages K-8 and K-9. Removing 85 acres from crop production may result in some small-scale change to current farming practices, but when the total acreage of cropland production within the site boundary is considered, the overall impact is minimal. Further, farmers will still have access to large swaths of cropland and construction of new roads or improvements to existing roads will improve access to fields. Landowners are also compensated under wind leases, offsetting the removal of 85 acres from crop production. Accordingly, the loss of 85 acres of cropland will not result in a significant increase in the cost of accepted farming practices.

Comment K2

Discuss whether the County would have jurisdiction to grant a variance (to the County's requirement for gates on private access roads) if the site certificate is issued.

Response to K2

GCDO 7.020(T)(d)(6) requires that private access roads be gated to protect the Facility and property owners from illegal or unwarranted trespass, illegal dumping, and hunting. For the most part, gates will be located at the entrance of Facility access roads. However, if a landowner does not want a gate on a private access road, a variance to GCDO 7.020(T)(d)(6) under GCDO 9.030 is warranted in such circumstance. The requirement for gates on private access roads protects the Facility and the property owner (other GCDO requirements address health and safety issues for the protection of the public). Consequently, if a landowner does not want a gate for property protection, IBR is willing to concede to the landowner that the gate would create more practical difficulties for the private landowner than public benefit. In addition, this circumstance would only arise at the landowner's request, meaning that the situation would not be created by IBR. Finally, requiring IBR to place a gate on a private access road where an underlying landowner objects could create an unnecessary hardship on IBR and potential damage to the landowner relationship. Therefore, should a landowner object to a gate on a private access road, a variance to this requirement is warranted under GCDO 9.030(A)-(D).

The GCDO allows the County to grant an unqualified variance or grant a variance subject to prescribed conditions, but under ORS 469.504(1)(b), EFSC has stepped into the County's role in determining whether the Facility complies with the applicable substantive requirements in the GCDO. Accordingly, in addition to making findings pursuant to GCDO 7.020(T)(d)(6), IBR requests that EFSC also make findings under GCDO 9.030 allowing a variance to GCDO 7.020(T)(d)(6) but only in circumstances where the landowner objects to the gate. Under this approach, EFSC will determine that the Facility complies with GCDO 7.02(T)(d)(6) subject to conditions in the Site Certificate, or alternatively, the requirement is waived by a variance subject to a prescribed condition.

Comment K3

K-34 says that the calculation of "high-value farmland" was based on a "conservative" assumption that various listed soil types are irrigated. If non-irrigated soils are properly classified (as non-high-value), how would that change the data shown in Table K-1? How would it change Figure K-6?

Would the facility interfere with irrigation on "high-value farmland?"

[Note, if you provide a new Figure K-6, please use higher-contrast colors to help us distinguish between soils that are "high value" and soils that are not "high value."]

The Notes to Table K-1 state that this table is based on Figure P-9. Figure P-9, however, shows the maximum habitat impact layout. A layout with the maximum wildlife habitat impact is likely to show the least impact on high value farmland. The "current layout" for the maximum number of turbines (Figure C-4) would be a better basis for calculating the "high value farmland" impacts.

The Notes to Table K-1 also indicate that 6.9 acres of Class VII soil areas are not included in the totals shown in the table. Class VII areas should be included as "non-high-value farmland." The Council has treated Class VII and VIII soils as agricultural land (see discussion in the Final Order on Amendment #1 for LJII at page 22).

Provide a revised Table K-1 that includes the Class VII areas and that reflects the proper classification of non-irrigated soils.

Response to K3

Figure K-6 has been revised. In this revised figure, soil classes are categorized based on whether the soil is actually irrigated (rather than conservatively assuming that all soils within the site boundary are irrigated). As a result, the amount of high-value farmland soils within the site boundary decreased by approximately 96 acres. Of the acres of high-value farmland soils within the site boundary, only 271 of these acres are irrigated and only a little more than 2 acres will be permanently impacted as shown in Application for Site Certificate (ASC) Table P-10 and Figure P-7. Further, rather than excluding Class VII soils from non-high-value farmland soils, Table K-1 has been revised so that non-high-value farmland soils include Class III-VII soils. Table K-1 values were revised based on the acreage of impacts for the current layout from Figure C-4 rather than on the basis of the acreage of impacts for the worst-case scenario layout from Figure P-9. Accordingly, the acreage of impacts to high-value farmland soils has decreased and the resulting numbers represent the actual impact to high-value farmland soils within the site boundary.

Comment K4

The Gilliam County Planning Department directed two comment letters to the Oregon Department of Energy on February 26 and March 8, 2010, respectively. The letters affirm the Planning Department's request that the Department of Energy consider and incorporate into the proposed order and site certificate select Gilliam County land use ordinance criteria as specified in the March 8 letter.

Response to K4

Copies of the letters from the Gilliam County Planning Department are provided in Attachment K-1. IBR has reviewed the letters and confirmed that the County's comments, including the identified relevant substantive criteria, are addressed in the ASC and in the Request for Additional Information (RAI) responses.

Email Response of April 2, 2010: Revised Table K-1, High-Value Farmland

Attached is a revised Table K-1 [see Attachment K-1], showing actual footprint in HV and non-HV land without overlap. The total impacts in this table do not exactly match any other table in the ASC because each table is generated out of GIS based on slightly different criteria; for example, you note that the total footprint shown in Table P-10 is slightly lower than what is shown in revised Table K-1. This is because the construction buffer used for these calculations shows impacts to Category 1 habitat, although in the field these areas would be flagged and no impacts would occur. Since no impacts to Cat 1 habitat would occur, those numbers were removed from Table P-10. Table K-1 is slightly more conservative in that no GIS-calculated impacts to HV and non-HV acres were removed from the total estimate.

Email Response of April 21, 2010: Land Use Standard

Comment 1

In RAI K2, we requested a discussion of County jurisdiction to grant a variance to GCZO Section 7.020(T)(4)(d)(6), which requires that private access roads to a wind power generating facility be gated. In response, IBR assumed that the Siting Council, not the County, would have jurisdiction to decide whether or not a variance should be granted. IBR cited ORS 469.504(1)(b), which describes the procedure for the Siting Council to make findings of compliance with the statewide planning goals. IBR proposed that the Council either grant a variance subject to a condition in the site certificate "but only in circumstances where the landowner objects to the gate" or, alternatively, grant a variance waiving the County ordinance "subject to a prescribed condition."

We do not believe that either approach could be implemented in a site certificate condition, and IBR has not proposed any condition language. IBR has not identified any property owner who has in fact objected to a gate being built on their property. Under GCZO Section 9.010, a variance may be authorized "where it can be shown that owing to special and unusual circumstances related to a specific lot, strict application of the ordinance would cause an undue or unnecessary hardship." From the information IBR has provided, there is no basis for the Siting Council to make such a determination, and there is no way for the Council to hypothesize all "special an unusual circumstances" by which a variance might be granted by site certificate condition.

After considering this matter further, we believe that a decision on a variance to GCZO Section 7.020(T)(4)(d)(6) is not essentially a decision about compliance with the statewide planning goals. Whether to grant a variance is a matter of the County enforcing its own public safety code. Accordingly, granting a gate variance is not a matter to be "included in and governed by the site certificate." Therefore, under ORS 469.401(4), we will recommend to the Council that the decision whether to grant a variance to the ordinance should be left to the County to decide on a case-by-case basis as the need arises. The County is in the best position to determine under what conditions the policy underlying the ordinance would be served by granting a variance. We have discussed this approach with Susie Anderson, Gilliam County Planning Director, and she is in agreement with this recommendation.

Response

IBR agrees with this recommended approach and will pursue a variance with Gilliam County should one be needed in the future.

Comment 2

In RAI K3, we requested a re-assessment of high-value (HV) farmland within the proposed site boundary. For soil types that would be HV farmland only if irrigated, we requested that IBR determine how many acres are, in fact, irrigated. We also requested that all Class VII and Class VIII soils be inventoried as non-HV agricultural land. IBR submitted a revised table K-1 in the initial RAI response (March 29, 2010) but later replaced this with a further revised Table K-1 (April 2, 2010) after the Department noted discrepancies in the data. Based

on this final revised Table K-1, only 2.35 acres of HV farmland would be occupied by MWPF components based on the current layout (Figure C-4). IBR also provided a revised Land Capability Classification map (Figure K-6) showing the location of the HV soils within the site boundary.

OAR 660-033-0130(37)(a)(A) requires the applicant to consider "reasonable alternatives" to locating the facility, or components of the facility, on high-value farmland. The analysis used to justify impacts on HV farmland in several recent site certificate orders was based on findings that no reasonable alternatives to impacts on HV farmland were available. In those cases, the Council found that there were multiple pockets of HV farmland interspersed with non-HV soils. The Council found that there were no large, contiguous areas of non-HV farmland within the wind resource area that were of sufficient size to locate the proposed wind energy facilities. The Council has found that an alternative location or configuration of a proposed wind power generation facility on land that does not contain HV farmland soils is not a "reasonable" alternative if the location or configuration would significantly increase the area within the site boundary, significantly increase the area permanently occupied by the facility's components or significantly increase the length of aboveground transmission lines that are necessary to connect the wind facility to the regional power grid.

Based on the revised Figure K-6, it appears that there are only a few small pockets of HV farmland within the proposed MWPF site boundary. These HV farmland areas appear to be limited to a small areas of Class II soil (colored bright yellow), mostly within Eightmile Canyon. There appears to be sufficient adjacent non-HV farmland where proposed facility components could be located within the proposed site boundary.

The justifications given in the site certificate application for concluding that there are no reasonable alternatives to locating facility components on HV farmland were based on IBR's earlier assumption regarding irrigation of areas that are not, in fact, irrigated (Application, Exhibit K, pp. 34-37). Although IBR's justifications might have been valid under the assumption that there were 1,314 acres of Class I HV soils and 9,801 acres of Class II HV soils within the site boundary (Application, Exhibit K, p. 34), these justifications do not apply when there are in fact very few areas of HV soil within the site boundary (the total acres of HV farmland within the site boundary under the revised calculation is unclear; IBR's statement in the response table that the amount of HV soils "decreased by approximately 96 acres" seems inconsistent with what is shown in the revised Figure K-6).

We propose that IBR microsite the facility components to avoid all HV farmland within the site boundary, and we would recommend that the Siting Council adopt a site certificate condition to that effect. Alternatively, if IBR cannot accept such a condition, then we request a revised justification explaining why the Council should conclude that are no reasonable alternatives to locating facility components on HV farmland, considering the very limited areas of HV farmland shown in revised Figure K-6.

Response

In response to RAI K3, IBR recalculated the acreage of high-value and non-high-value farmland soils within the site boundary based on whether the soil was actually irrigated (rather than conservatively assuming that all soils within the site boundary are irrigated, as had been done for past projects like Helix and Leaning Juniper II). In addition, rather than

separating out Class VII and VIII soils, IBR included these soils within the non-high-value farmland soil calculations. Revised Table K-1 submitted in response to RAI K3 summarizes the total permanent impacts to high-value and non-high-value farmland soils based on these revised calculations.

The narrative response to K3, however, mistakenly states that the total amount of high-value farmland soils within the site boundary was reduced by 96 acres. In actuality, and as summarized below, 96 acres is the decrease in permanent impacts to high-value farmland soils when the conservative assumption is not used. Further, the RAI response states that "of the acres of high-value farmland soils within the site boundary, only 271 acres of these acres are irrigated and only a little more than 2 acres will be permanently impacted." This statement mischaracterizes the irrigated acreage as being all high-value farmland soils. As shown by the revised calculations, based on the NRCS soil types and the soils currently irrigated within the site boundary, the total high-value farmland soil acreage is less than 271.

What this means is while there may be 271 acres of irrigated land within the site boundary (as determined during the habitat work, and illustrated on Table P-10 and Figure P-7 in the ASC), not all irrigated land is high-value farmland soils based on the underlying NRCS soil types. This conclusion was confirmed with Jordan Maley, the OSU extension agent for Gilliam County by Elaine Albrich on April 20, 2010. Mr. Maley said that while it may not be the best economically (given soil productivity), farmers will irrigate non-high-value farmland soils within a crop circle, and consequently, it is correct to say that just because farmland is irrigated doesn't mean that it is high-value farmland soil.

Old Numbers: Exhibit K states that there are approximately 33,402 acres of EFU land within the site boundary. Of those 33,402 acres, 1,314 acres are Class I soils, 9,801 acres are Class II soils, and 22,287 acres are non-high-value farmland soils. See page K-34 of Exhibit K. As described above, the Class I and Class II soils were calculated using the original assumption that all soil types were irrigated. Original Table K-1 showed that out of the 11,115 acres of high-value farmland soils, 98.179 acres would have been permanently impacted. After taking into account what is actually irrigated currently, these numbers changed considerably.

New Numbers: Out of the 33,402 acres within the site boundary (recognizing that the rounding and GIS layers make the numbers below total 33,403 acres):

Class I soils = 0 acres

Class II soils = 186 acres

Class III-VIII soils = 33,217 acres

Out of the 186 acres of high-value farmland soils, 2.351 acres will be permanently impacted. Out of the 33,217 acres of non-high-value farmland soils, 218.998 acres will be permanently impacted. See Revised Figure K-1.

Analysis under OAR 660-033-0130(37): IBR previously employed a conservative assumption when analyzing compliance with OAR 660-033-0130(37). The conservative assumption (assuming that all soil types were irrigated) resulted in more land within the site boundary being deemed high-value farmland soils. See Original Figure K-6. This

method allowed findings to be based on the "worst-case scenario" for impacts to high-value farmland soils, meaning that there was no risk of having non-high-value farmland soil "bump up" to a high-value farmland soil if a landowner began irrigating it but not having this amount accounted for in the impact calculations.

Under the calculation method requested in RAI K3, the calculation is not based on a worst-case scenario but rather a snap-shot in time. The soil classes are based on what is irrigated at the time of the surveys. IBR is agreeable to using this requested approach for the basis of findings under OAR 660-033-0130(37) as long as ODOE does not require re-surveying to confirm that there have been no changes in irrigation prior to construction. In other words, there is an understanding that the basis for calculating permanent impacts to farmland soils and findings of compliance with OAR 660-033-0130(37) is based on a one-time examination of what soils are irrigated within the site boundary.

Based on the revised calculations, the amount of high-value farmland soils within the site boundary totals 186 acres. There are only three concentrations of high-value farmland soils within the site boundary, and only one area would be permanently impacted, as shown on Figure K-6a (detailed view provided in Attachment K-1). Specifically, an access road and overhead 34.5-kV collector line structures would permanently impact 2.351 acres of high-value farmland soils (2.348 and 0.003 acres, respectively).

The impacts associated with the access road are from improvements to the existing County road (Eight Mile Canyon Road) within an existing County right of way that runs through high-value farmland soils. See Figure K-6a in Attachment K-1. The majority of the high-value farmland soils are located on the east-side of the road, although there is also a thin swath of high-value farmland soils on the west-side of the road. Avoiding impacts to these areas would mean having to re-route the existing County road outside of the current County road right-of-way. To avoid the majority of the high-value farmland soils, the road would need to be moved further west, but this adjustment would cause the road to run straight through Category 1 WGS habitat (see the identified area on Figure K-6a in Attachment K-1).

Alternatively, the road could be re-routed to the east but this would require moving the road beyond the majority of the high-value farmland soils. This re-route would result in greater acreage impacts given that the route would be less direct and increase in length. Either re-route option would increase disturbance because either option would not use the existing road and right-of-way and either option would be a less direct route. Finally, re-routing a portion of the existing County road would require coordination and consultation with the County and does not seem to be something that is contemplated under OAR 660-033-0130(37) given the reference to use of existing rights-of-ways under subsection (a)(A)(ii). Therefore, even though this portion of the Facility would be located on high-value farmland soils and reasonable alternatives have been considered, the proposed access road route is allowed given the factors in OAR 660-033-0130(37)(a)(A).

With respect to the 0.003 acres of impact associated with the overhead collector line poles, the collector line is routed to cross Eight Mile Canyon Road in the vicinity of the impacted area of high-value farmland in order to avoid greater environmental impacts. Specifically, the collector line cannot be routed on the west side of the road because it would need to be sited within the Category 1 WGS habitat. IBR recognizes that this re-route may be shorter in

length and eliminate one of two stream crossings, it is not feasible to span the line across the Category 1 habitat but given the engineering and site conditions. See Figure K-6a in Attachment K-1. Therefore, even though this portion of the Facility would be located on high-value farmland soils and reasonable alternatives have been considered, the proposed collector line route is allowed given the factors in OAR 660-033-0130(37)(a)(A).

For these reasons, IBR believes the Facility compiles with OAR 660-033-0130(37), and although alternatives were considered, the proposed layout is the most reasonable after considering of the factors outlined in OAR 660-033-0130(37)(a)(A). IBR request the Council approve the layout of the Facility as proposed and not impose a condition requiring avoidance of the 2.351 acres of high-value farmland soils within the site boundary.

EXHIBIT L

Protected Areas

Email Response of April 21, 2010: Protected Area Standard

Comment

Exhibit L of the application omitted discussion of the Willow Creek Wildlife Area, which is a protected area under OAR 345-022-0040(1)(p). In addition, State parks and waysides "listed" by OPRD are protected areas under OAR 345-022-0040(1)(h). In a comment letter (RAI RAC2), OPRD identified Arlington, John Day (Hildebrand) and Cottonwood Canyon as State parks. We have requested clarification from OPRD as to whether these parks are considered "listed" and also clarification of the status of the "J.S. Burres" area shown on the map provided by OPRD. We request that IBR supplement the application with a brief discussion about any potential impacts on the parks OPRD identified in the comment letter and on the Willow Creek Wildlife Area.

Response

As requested, this response supplements the application with a brief discussion of potential impacts on the parks identified by the Oregon Parks and Recreation Department (OPRD) in the RAI RAC2 comment letter, and on the Willow Creek Wildlife Area.

IBR's analysis in Exhibit L of the ASC did not identify any significant potential impacts to the four protected areas listed in Table L-1 of Exhibit L in the ASC. IBR's supplemental analysis of the Willow Creek Wildlife Area, Arlington wayside (referred to as a state park in IBR's response to RAI RAC2; see Attachment 14 of the RAI responses submitted on March 29, 2010 [Exhibit R of this Supplement: subsection titled Reviewing Agency Comments from Oregon Parks and Recreation Department), John Day (Hildebrand) property (referred to as a state park in the RAI RAC2 response), and Cottonwood Canyon State Park results in a similar conclusion. The MWPF will not result in significant adverse impacts to these more recently identified protected areas from noise, traffic, water use, wastewater disposal, or visual impacts.

The Willow Creek Wildlife Area, Arlington wayside, John Day (Hildebrand) property, and Cottonwood Canyon State Park are all located at greater distances from MWPF then the four protected areas previously identified by Table L-1 in the ASC. The Willow Creek Wildlife Area is located approximately 8 miles northeast of MWPF on Willow Lake at the mouth of Willow Creek. The Arlington wayside is located approximately 6.3 miles north of MWPF on I-84 and the Columbia River (see revised Figures R-1 and T-1 in Attachment 14 of the RAC2 response [Attachment T-1 in this Supplement]). The John Day Hildebrand property, owned by OPRD, is located along the John Day River approximately 5 miles east of MWPF (see revised Figures R-1 and T-1). Finally, Cottonwood Canyon State Park comprises separate parcels recently acquired by OPRD and located adjacent to the John Day River approximately 8 miles from MWPF (see revised Figures R-1 and T-1). The property for

this park is directly adjacent to and eventually will encompass the J.S. Burres State Park, which is currently managed by the BLM (Houck, 2010).

Noise. There will be no impacts from noise on the four more recently identified protected areas. As detailed in Exhibit X of the ASC, projected noise levels resulting from construction and operation of MWPF will meet requirements contained in Oregon Department of Environmental Quality rules. Given projected noise levels and the distance between turbine locations and protected areas, noise resulting from MWPF construction and operation will not significantly affect any protected areas in the 20-mile analysis zone.

Traffic. Increased traffic resulting from MWPF construction or operation will not adversely impact the four more recently identified protected areas. The primary transporter route identified in Exhibit L of the ASC will be eastbound Interstate 84 (I-84) and southbound on Oregon Highway 19 (OR 19; also known as John Day Highway) near Arlington, Oregon. This route does not go through or near any of these protected areas. The two alternative transporter routes include eastbound I-84 and southbound on either Blaylock Canyon Road or OR 74. The Blaylock Canyon Road route also does not go through or near any of these protected areas. The second alternative route passes near the Arlington wayside, but does not pass through or near any of the other three recently identified protected areas. The segment of this alternative route that passes near the Arlington wayside is along I-84, which is a main east-to-west corridor in the United States. Thus, any traffic volume using this alternative route for construction or operation of the MWPF will be minimal compared to the existing volume on I-84.

Water. Water use for MWPF will not impact any of the four more recently identified protected areas. The water sources identified in Exhibit L of the ASC (City of Arlington and well within MWPF site boundary) are not on or near these protected areas.

Wastewater. Wastewater from MWPF will not impact any of the four more recently identified protected areas for the same reasons explained in Exhibit L of the ASC. The few potential wastewater sources identified in Exhibit L are not located on or near any of these protected areas.

Visual. Construction and operation of MWPF will not result in visual impacts to any of the four more recently identified protected areas. Again, the John Day (Hildebrand) property is the protected area nearest MWPF, located approximately 5 miles from the nearest portion of the site boundary that will contain turbines. Thus, any visible turbines will appear as smaller elements in the background at these distances (5 miles or greater). In addition, the zone of visual impact (ZVI) analysis presented in Figures L-1 and L-2 in Exhibit L of the ASC, and in the revised Figure R-1 provided in Attachment 14 to the RAC2 response [Attachment T-1 in this Supplement], was revisited to determine whether any turbines will be visible from these protected areas.

The ZVI shows that MWPF will not visible from Arlington wayside, John Day (Hildebrand) property, or Cottonwood Canyon State Park. In addition, the Arlington wayside is also located along the Columbia River with views directed north toward the river and away from MWPF. The John Day (Hildebrand) property and Cottonwood Canyon State Park are situated directly adjacent or near the John Day River. Thus, views will be blocked by the steep topography adjacent to the river. The ZVI shows that small areas within the Willow

Creek Wildlife Area may have limited views of turbines. However, the portion of this protected area located nearest MWPF will be approximately 8 miles from the portion of the site boundary that will contain turbines. Thus, distance will greatly diminish the visibility of any turbines. In addition, this wildlife area is located adjacent to the Columbia River, north of MWPF. The majority of views in the wildlife area are focused away from MWPF either north toward the Columbia River or across Willow Lake to the east or west. Views of MWPF turbines would have to focus south.

The design, construction, and operation of MWPF are not likely to result in significant adverse impacts to the four more recently identified protected areas. Because there are no significant adverse impacts, no mitigation is proposed.

Reference:

Houck, Jan. 2010. Personal communication via telephone between Jan Houck (Oregon Parks and Recreation Department) and Paul Seilo (CH2M HILL) on March 9.

Comment

In Exhibit L, IBR discussed potential noise impacts on nesting long-billed curlews in the Horn Butte ACEC (Application, Exhibit L, p. 3). IBR reasoned that because the Siting Council has previously found that the Shepherds Flat project is "not expected to be a significant source of disturbance to nesting long-billed curlews or to other nesting avian species" in the Horn Butte ACEC, the Council should also find that proposed MWPF would not cause a significant disturbance "because the approved Shepherds Flat facility is located closer to the Horn Butte ACEC than the proposed Facility." Horn Butte ACEC, however, consists of several separate parcels of BLM land, some of which appear to be immediately adjacent to the proposed MWPF site boundary.

The Council's previous finding with regard to the potential noise disturbance to nesting curlews from the Shepherds Flat project was subject to a site certificate condition that prohibited construction activity within a half-mile of the area during the curlew nesting season (March 8 through June 15). Would IBR accept a similar site certificate condition with regard to the MWPF?

Portions of the John Day State Scenic Waterway lie within the scenic resources analysis area for MWPF, as shown on Figure R-1. We propose to make the same recommended findings for MWPF as were made for Leaning Juniper II with regard to the John Day State Scenic Waterway.

Response

IBR proposes the following site certificate condition to protect nesting long-billed curlews similar to the protection implemented for nesting raptors. This condition is similar to Condition 86 from the Leaning Juniper II First Amended Site Certificate.

During construction of the facility, within the wind-leased lands, the certificate holder shall protect the area within 1300-feet of the BLM Horn Butte ACEC during the nesting season (March 8 through June 15). Before beginning construction, the certificate holder shall provide to the Department a map showing these avoidance areas relative to areas of potential construction disturbance. The certificate

holder shall not engage in high-impact construction activities (activities that involve blasting, grading or other major ground disturbance) or allow high levels of construction traffic within 1300 feet of the ACEC. In addition, the certificate holder will flag the boundaries of the 1300-foot buffer area and shall instruct construction personnel to avoid any unnecessary activity within the buffer area. The certificate holder may engage in construction activities in these areas at times other than the nesting season.

EXHIBIT M

Financial Analysis

Email Response of April 21, 2010: Financial Assurance

Comment (dated March 4, 2010)

In our list of corrections and clarifications (March 4, 2010), we requested a financial assurance "comfort letter" in an amount equal to or greater than the Department's estimate of site restoration costs. We have not reached a final calculation of site restoration costs, but based on our preliminary estimate, we anticipate that site restoration costs will not exceed IBR's highest-cost estimate (excluding offset for scrap value) of $21.219 million (Exhibit W, Table W-1). We therefore request that IBR provide a "comfort letter" or other evidence that IBR has a "reasonable likelihood" of obtaining financial assurance in that amount.

Response (final response dated April 21, 2010)

A "comfort letter" of reassurance is provided in Attachment M-1.

EXHIBIT O

Water Resources

Informal RAI (Response dated March 12, 2010)

Comment

Provide a signed copy of the letter from Tim Wetherell (on City of Arlington letterhead, if available).

Response

Attachment O-1 contains a signed copy of the letter from Tim Wetherell on City of Arlington letterhead (see Attachment O-1).

EXHIBIT P

Fish and Wildlife Habitats and Species

Informal RAIs (Responses dated March 12, 2010)

Informal RAI Comment 1

When did NWC initiate the "avian use surveys at six additional plots"? When were these completed? Are these the "2009 Fall Season Montague Avian Use Surveys" described at page 8 of [ASC] Attachment P-7?

Response

Response e-mailed to John White/ODOE and Kara Warner/Golder on March 5, 2010, with a table of onsite surveys to be completed. As shown in item number 6 of the survey table, fall season avian use surveys of six plots (AA, BB, EE, FF, GG, and HH) began on September 10, 2009, and could continue for one full year. See revised survey table provided in Attachment P-1.

Informal RAI Comment 2

Provide Tables P-10 and P-11 in Excel format.

Response

Response e-mailed to John White/ODOE and Kara Warner/Golder on March 5, 2010, with Excel versions of Tables P-10 and P-11 ("20a" and 20b"). (See Attachment P-2.)

Informal RAI Comment 3

P-70 says that there have been no long-billed curlew fatalities found at any existing wind facilities; Attachment P-7, page 44, says that one long-billed curlew fatality was found at Pebble Springs. Is P-70 incorrect?

Response

Response e-mailed to John White/ODOE and Kara Warner/Golder on March 5, 2010: The latter sentence is correct. No long-billed curlew fatalities had been found at existing wind facilities according to final public fatality monitoring reports (page P-70). However, one long-billed curlew fatality recently was found at Pebble Springs and will be reported in the final fatality monitoring report.

RAI No. 1 (Responses dated March 29, 2010)

Comment P1

This RAI and the others below that are marked as "{future study}" address on-site surveys described in the application that have not been completed to date. Provide a schedule for the completion of these studies (including completion of data analysis and written reports and expected dates of submission of the information to the Department).

If the Department finds the application to be complete (except for these studies) before all of the studies are done, the Department will consider addressing the completion of studies by appropriate site certificate conditions, provided that the mitigation of potential impacts is adequately addressed.

{future study} The application describes a "focused botanical survey" that needs to be completed. What is the scope of this survey? When would the survey be done? When would IBR report the results to the Department?

IBR may propose condition language for use if the Department finds the application is otherwise complete before the survey results have been reported. Proposed condition language should address mitigation for any potential impacts identified by the survey.

Response to P1

1. Attachment 4 [subsequently updated and provided as Attachment P-1 in this Supplement] contains a schedule of onsite surveys to be completed. Please refer to row 1 in the Attachment P-1 schedule.
2. Noted.
3. Please refer to Attachment 4 [subsequently updated and provided as Attachment P-1 in this Supplement] for a description of the scope and timing of the surveys. The report would be provided to the Department prior to construction, as described in the proposed condition below.
4. Condition Language: IBR proposes a SC condition similar to the Helix SC condition 91 to address the preconstruction surveys discussed in RAI P1-P6:

The certificate holder may construct turbines and other facility components within the site boundary as described in the Final Order on the Application, subject to the following requirements addressing potential habitat impact:

a) The certificate holder shall not construct any facility components within areas of Category 1 habitat and shall avoid temporary disturbance of Category 1 habitat.

b) Before beginning construction, the certificate holder shall provide to the Department a map showing the final design locations of all components of the facility, the areas that would be disturbed during construction, and the areas that were surveyed in 2010 or earlier as described in the site certificate application. The certificate holder shall hire a qualified professional biologist to conduct a preconstruction biological investigation of all areas to be disturbed during construction that lie outside of the areas surveyed in 2010 or earlier. The certificate holder shall provide a written report of the investigation to the Department and to the Oregon Department of Fish and

Wildlife (ODFW). Based on consultation with the Department and ODFW, the certificate holder shall implement appropriate measures to avoid impacts to any Category 1 habitat or to any State-listed plant or wildlife species found during the investigation.

c) *Before beginning construction, the certificate holder's qualified professional biologist shall survey the edge of the previously-identified Washington ground squirrel colony to ensure that the sensitive use area is correctly marked with exclusion flagging and avoided during construction. The certificate holder shall maintain the exclusion markings until construction has been completed.*

d) *Before beginning construction, the certificate holder shall hire a qualified professional biologist to conduct a pre-construction raptor nest survey within a half-mile buffer of the final transmission line route and within a two-mile buffer of the turbines in all areas that were not previously surveyed as described in the site certificate application. The purpose of the survey is to identify any sensitive raptor nests near construction and to provide baseline information on raptor nest use for analysis as described in the Wildlife Monitoring and Mitigation Plan.*

e) *In the final design layout of the facility, the certificate holder shall locate facility components to avoid or minimize temporary and permanent impacts to high quality native habitat and to retain habitat cover in the general landscape where practicable.*

Comment P2

{future study} The application describes "special status wildlife surveys" that need to be completed. What is the scope of these surveys? When would they be done? When would IBR report the results to the Department?

IBR may propose condition language for use if the Department finds the application is otherwise complete before the survey results have been reported. Proposed condition language should address mitigation for any potential impacts identified by the surveys.

Response to P2

Attachment 4 [subsequently updated and provided as Attachment P-1 in this Supplement] contains a schedule of onsite surveys to be completed. Please refer to row 4.

Comment P3

{future study} The application describes "surveys for the remaining area within the Facility 2-mile raptor survey radius" (approximately two-thirds of the study area) that need to be completed. The application describes both aerial raptor surveys and walking transect surveys for raptor nests. What is the scope of these surveys? When would they be done? When would IBR report the results to the Department?

IBR may propose condition language for use if the Department finds the application is otherwise complete before the survey results have been reported. Proposed condition language should address mitigation for any potential impacts identified by the surveys.

Response to P3

Attachment 4 [subsequently updated and provided as Attachment P-1 in this Supplement] contains a schedule of onsite surveys to be completed. Please refer to rows 4 and 5.

Please refer to response P1, no. 4, for proposed condition language.

Comment P4

{future study} The application describes "the remaining three seasons of avian use studies" that need to be completed. What is the scope of these studies? When would they be done? When would IBR report the results to the Department?

IBR may propose condition language for use if the Department finds the application is otherwise complete before the survey results have been reported. Proposed condition language should address mitigation for any potential impacts identified by the survey.

Response to P4

Attachment 4 [subsequently updated and provided as Attachment P-1 in this Supplement] contains a schedule of onsite surveys to be completed. Please refer to row 6.

Please refer to response P1, no. 4, for proposed condition language.

Comment P5

{future study} The application describes "ground transect surveys" that need to be completed. What is the scope of these surveys? When would they be done? When would IBR report the results to the Department?

IBR may propose condition language for use if the Department finds the application is otherwise complete before the survey results have been reported. Proposed condition language should address mitigation for any potential impacts identified by the surveys.

Response to P5

Attachment 4 [subsequently updated and provided as Attachment P-1 in this Supplement] contains a schedule of onsite surveys to be completed. Please refer to rows 4 and 5.

Please refer to response P1, no. 4, for proposed condition language.

Comment P6

{future study} The attachment describes revisits to previously identified WGS holes as well as surveys of previously unsurveyed corridors for WGS. What is the scope of these surveys? When would they be done? When would IBR report the results to the Department?

IBR may propose condition language for use if the Department finds the application is otherwise complete before the survey results have been reported. Proposed condition language should address mitigation for any potential impacts identified by the surveys.

Response to P6

Attachment 4 [subsequently updated and provided as Attachment P-1 in this Supplement] contains a schedule of onsite surveys to be completed. Please refer to row 3.

Please refer to response P1, no. 4, for proposed condition language.

Comment P7-1

Current ODFW guidance (letter from Rose Owens, December 3, 2009) states that "a single occupied WGS burrow and a 785-foot buffer of suitable habitat around the burrow, would all be considered Category 1 habitat, since it is all considered required habitat for squirrel survival." ODFW has defined a "colony" as "the cluster of holes as well as the required habitat for squirrel survival" and ODFW defined "required habitat for squirrel survival" as the area "depicted by a 785-foot ring around the outside of the cluster of holes where the Washington ground squirrels are residing" (letter from Rose Owens, September 15, 2008, included in the application as Attachment P-2). ODFW has advised that "the Category 1 required habitat for squirrel survival can be less than 785 feet from the outer edge of clusters of holes when interrupted by habitat types not suitable for foraging or burrow establishment."

This issue was discussed at the meeting on 2/25/10. Confirm for the record that IBR applied the current ODFW guidance regarding a 785-foot buffer around WGS burrows for all identified WGS detections listed, except WGS Sites #5, #8, #13 and #25. Thus, any inconsistency between IBR's Montague application and current ODFW guidance is limited to these four sites. Provide further explanation if this is not correct.

Response to P7-1

IBR applied a 785-foot buffer around all identified WGS sites with multiple burrows. However, IBR did not apply the 785-foot buffer to WGS Sites #5 and #8 because these sites are single burrows, not colonies. In addition, IBR mistakenly applied a 785-foot buffer around WGS Site #13, although this site is also a single burrow. The corrected buffer is shown in a new Figure Q-2c provided in Attachment P-3 [CONFIDENTIAL].

IBR applied the 785-foot buffer in suitable habitat around all other sites.

Any inconsistency between IBR's Montague application and ODFW December 3, 2009, guidance is limited to these three sites. A 785-foot buffer in suitable habitat was applied around Site #25. The buffer around Site #25 is clipped to wheat fields, as shown in the new Figure Q-2c.

Comment P7-2

Explain the "pie-shaped" buffer around #13. It appears that no facility components would have to be moved even if a 785-foot buffer surrounded the entire #13 location.

Response to P7-2

The "pie-shaped" buffer around #13 resulted from limitation of the buffer to suitable habitat (Figure P-8 in Exhibit P). As explained in the response to P7-1, the 785-foot buffer was mistakenly applied around WGS Site #13 in the ASC. This site is a single burrow, and the corrected buffer is shown in a new Figure Q-2c provided in Attachment P-3 [CONFIDENTIAL].

Comment P7-3

Explain why WGS Site #25 was not listed in Table Q-2.

Response to P7-3

Site #25 was not listed in Table Q-2 because it was identified as part of the Leaning Juniper II surveys. It is described in Table 12 of Attachment 7 to the LJII *Request for Amendment* (June 2009). Table Q-2 has been revised to include this location (see Attachment P-4). Site #25 is the WGS site directly to the east of the G string referenced in ODFW's comment letter (see response to Comment ODFW RAC3 in the section titled Reviewing Agency Comments from Oregon Department of Fish and Wildlife).

The ODFW comment letter also asked about WGS Site #12 between the FF and GG strings. The proposed improved road running through the Category 1 habitat associated with Site 12 is Tree Lane, which is a Gilliam County road. If any improvements are needed to this road, they would be made entirely within the County road right-of-way and in compliance with the County Road Use Agreement. The turbine string access road from Tree Lane to the GG turbine string would be constructed entirely outside the 785-foot buffer, as shown in the new Figure Q-2c provided in Attachment P-3 [CONFIDENTIAL].

Comment P7-4

For sites #5, #8, #13 and #25, provide the year (or years) of the surveys in which the detections were made.

Response to P7-4

Sites #5 and #8 were detected in 2008 and sites #13 and #25 were identified in 2009.

Comment P7-5

For sites #5, #8, #13 and #25, describe the habitat types of the areas within 785 feet of the sites and the suitability of these areas for WGS foraging or burrow establishment.

Response to P7-5

The habitat types of the land within 785 feet of the WGS sites are described in Figure P-8 and Figure Q-2c (Attachment P-3 [CONFIDENTIAL]), and in Table Q-2 (Attachment P-4).

Comment P7-6

For sites #5, #8, #13 and #25, what would be the consequences to proposed facility components if the current ODFW guidance were applied?

Response to P7-6

The consequence of applying a 785-foot buffer around these sites or other single burrows that may be identified during the 2010 preconstruction surveys is that there is less room to microsite and design the turbines, roads, and collector lines.

Comment P8

Provide more detail regarding the use of "the latest turbine designs and micrositing wind turbines to avoid areas of high bird use." How have turbine designs changed to reduce avian fatalities? What areas of high bird use would be avoided?

Response to P8

As described on page P-65 of the ASC, wind turbine design has changed significantly since the first large wind facilities, such as those in the Altamont Pass Wind Resources Area, were developed. Turbines typically are installed on tubular steel towers instead of lattice towers, without open platforms at the top of the tower, substantially reducing perching and nesting opportunities for raptors and other birds.

Turbines are now much larger, and blades move at lower revolutions per minute (rpm). Presumably the blades are more visible to raptors than blades on the older, smaller turbines. For example, the blades of the 1.5-MW turbines installed at Klondike I, II, and III projects turn at approximately 20 rpm, compared to more than 60 rpm for the Kenetech 56-100 downwind turbine, the most common turbine at Altamont Pass. Blade tip speeds are similar for both new-generation and old-generation wind turbines. Although the relationship between blade tip speed and mortality is unknown, it is presumed that rpm is a factor in avian mortality, because avian ability to distinguish blade speed and blade position decreases as rpm increases.

Further discussion of avian studies and turbine design can be found on page P-65 of the ASC.

Specific micrositing measures to avoid areas of high bird use and minimize the risk of collision mortality to individual birds at the Facility will include minimizing turbine placement in high-value native habitats such as grassland, shrub-steppe, and riparian areas. In addition, during final Facility design, the Facility will be microsited to avoid impacts to Category 1 habitat, and to avoid and minimize both temporary and permanent impacts to high-quality native habitat where practicable. Before construction, IBR will contract Northwest Wildlife Consultants, Inc. (NWC) to participate in the turbine micrositing in order to identify whether any micrositing should occur in saddles or other areas of potentially higher avian use.

Comment P9

The application states that IBR will implement a WMMP, a Revegetation Plan, and a Habitat Mitigation Plan. Provide drafts of the proposed WMMP, Revegetation Plan and Habitat Mitigation Plan, based on the comparable plans for Leaning Juniper II (*Final Order on Amendment #1*, November 20, 2009). Make edits of the LJII plans that are appropriate for Montague, and submit the drafts showing the tracked changes.

Response to P9

Drafts of the proposed Wildlife Monitoring and Mitigation Plan, Revegetation Plan, and Habitat Mitigation Plan have been provided to the Department. IBR based the drafts on the

comparable plans for Leaning Juniper II (*Final Order on Amendment #1*, November 20, 2009) and has edited the plans as appropriate for Montague. Edits are tracked.

Comment P10

What measures will be taken to "be prepared for a quick response to wildfires"?

Response to P10

IBR will implement fire safety measures consistent with Conditions 60 through 65 in the *First Amended Site Certificate for the Leaning Juniper II Wind Power Facility* (November 20, 2009). For example, during construction and operation of the Facility, IBR will ensure that the operations and maintenance facility and all service vehicles are equipped with shovels and portable fire extinguishers of a 4A5OBC or equivalent rating. In addition, during Facility construction and operation, IBR will develop and implement fire safety plans in consultation with the North Gilliam County Rural Fire Protection District and the Arlington Fire Department to minimize the risk of fire and to respond appropriately to any fires that occur on the facility site. In developing the fire safety plans, IBR will take into account the dry nature of the region and should address risks on a seasonal basis. IBR will meet annually with District and Fire Department personnel to discuss emergency planning and plans to invite District and Fire Department personnel to observe any emergency drill or tower rescue training conducted at the Facility.

Comment P11 (from IBR)

IBR recently received an update to the report titled *Avian and Bat Cumulative Impacts Associated with Wind Energy Development in the Columbia Plateau Ecoregion of Eastern Washington and Oregon* provided in Attachment P-8 of the ASC. The report was prepared by WEST, Inc., for Klickitat County Planning Department, Washington, and was updated in February 2010. The updated report is included in Attachment P-5.

Reviewing Agency Comments from Oregon Department of Fish and Wildlife (Responses dated March 29, 2010)

Comment ODFW RAC1

Surveys for sensitive species are not complete. The Application states that the remaining biological surveys for raptor nests, avian point counts, and Washington ground squirrels will take place in the spring of 2010. However, without this data ODFW is unable to effectively comment on potential wildlife concerns and required mitigation measures.

Response

Please see responses to RAIs P-1 through P-6 above.

Comment ODFW RAC2

On page P-21 of the Application the Applicant outlines the definition of Category 1 Washington ground squirrel habitat. The Department understands that the Applicant does not agree with the Category one guidance outlined in our letter to ODOE on 12-3-09.

However, it is unclear in the Application if the protection measures outlined by ODFW are being used to protect WGS on the project area.

ODFW would recommend that the Applicant follows the guidance in our letter to ODOE on 12-3-09.

Response

Please see response to RAI P-7.

Comment ODFW RAC3

Figure P-3 shows a WGS site directly to the east of the G string near the boundary of the project however Figure P-8b does not show an associated Category 1 buffer around that site. The Department needs to have clarification one why this site does not have any associated protection measures.

Response

Please see response to RAI P-7.

Comment ODFW RAC4

Figure P-8c shows a WGS colony between the FF and GG strings and a proposed improved road running through the Category 1 habitat associated with this colony. ODFW understands that this improved road is Tree Lane and is a Gilliam County road. However, it is unclear what proposed improvements would be made to the road as part of this Application.

Response

Please see response to RAI P-7.

Comment ODFW RAC5

The Wildlife and Habitat Mitigation plan is mentioned several times but was not included with the Application for Site Certificate documents. The Application included mitigation through project site selection that has occurred so far.

Mitigation plans must specifically describe the actions which will be taken to mitigate the impacts of the proposed project on fish and wildlife species and habitat identified in the biological surveys. The proposed mitigation must be consistent with the Oregon Habitat Mitigation Policy. The Department looks forward to working with the Applicant on the mitigation plan and is comfortable that a Condition in the Certificate similar to the draft Condition 89 as written in the Application would allow the Applicant and ODFW to work cooperatively to create a plan that would meet the Mitigation Policy. However, until completed, ODFW cannot effectively determine if it meets the Oregon Mitigation Policy.

Response

The draft wildlife mitigation and monitoring plan and habitat mitigation plan are provided. [Note: To avoid confusion with subsequent revised versions of both plans, the RAC5 versions are not included in this Supplement.]

Comment ODFW RAC6

The revegetation plan is not included in the Application and will need to be completed before the application is considered complete. The plan should list plant species which will be used, the timing of revegetation, and methods for conserving topsoil for revegetation.

Response

The draft revegetation plan is provided in Attachment P-6.

Comment ODFW RAC7

The Application for a Site Certificate does not include a post-construction monitoring plan for the Facility. The Application outlines a draft Condition 87 that will be incorporated in the Final Order requiring the completion of the plan. ODFW would recommend that the plan would include monitoring known Washington ground squirrel sites adjacent to site facilities.

Response

A post-construction monitoring plan is provided in ASC Attachment 7 (Wildlife Monitoring and Mitigation Plan). [Note: To avoid confusion with the later revised version of this plan, included in the Supplement as Attachment P-6, the RAC7 version is not attached.]

Reviewing Agency Comments from U.S. Fish and Wildlife Service (Responses dated March 29, 2010)

Comment USFWS RAC1

Avian and Bat Protection Plan. The Service recognizes the contribution made by Iberdrola Renewables (Iberdrola) in the development and adoption the 2008 Oregon Columbia Plateau Ecoregion Wind Energy Siting and Permitting Guidelines (Guidelines). To further minimize impacts to bats, eagles, and other avian species, Iberdrola in partnership with the Service completed an Avian and Bat Protection Plan (ABPP) (dated October 10, 2008) to be applied across its corporate wind energy program. These efforts indicate a commitment to promoting development of clean energy production, with its associated environmental benefits, while limiting the adverse environmental effects that can be associated with wind energy production.

The Service recommends that the ABPP be updated to include finalized new regulations and implementation guidance regarding limited take of bald and golden eagles under the BGEPA. The new program makes available two new types of permits that will be used to improve the management of bald and golden eagles, protect public safety, and manage activities or projects that may disturb or otherwise incidentally "take" bald or golden eagles or their nests, while maintaining stable or increasing populations. Until we have additional data to show that golden eagle populations can withstand additional take, of those permits authorized under the new rule, we will only consider permits for safety emergencies, programmatic permits, and any other permits that will result in a reduction of ongoing take or a net take of zero. The Final rule and the Final Environmental Assessment can be found online at: http://www.fws.gov/migratorybirds/.

Proper siting and placement of infrastructure known to be lethal or injurious to eagles is essential to avoid take. Measures including siting to avoid disturbance take and lethal take need to take into greater considerations life-history components such as dispersal, migration, winter concentration behavior, and foraging behavior during breeding and non-breeding seasons. Project turbine siting and associated construction should be designed to avoid take to eagles. Take may only be authorized where it is consistent with the goal of stable or increasing breeding populations and when the take cannot practicably be avoided.

Response

IBR's Avian and Bat Protection Plan (ABPP) currently references the USFWS permit program development bald and golden eagles under the Bald and Golden Eagle Protection Act. IBR plans to update its ABPP to include both the Wind Turbine Guidelines Federal Advisory Committee Recommendations and new regulations regarding limited take of bald and golden eagles. Jerry Roppe, IBR's Wind Operations Wildlife Permitting Compliance Manager, is coordinating with the USFWS national and regional offices on these updates.

As described in Exhibit BB of the ASC, IBR will identify raptor nests, including eagle nests, within the proximity of transmission line poles or other Facility components. Nests will be avoided. IBR will not engage in high-impact construction activities (activities that involve blasting, grading, or other major ground disturbance) or allow high levels of construction traffic within 1,300 feet of these nest sites during the nesting season.

Comment USFWS RAC2

During the NOI phase of the Project, the Service made recommendations that the final Project design (towers, electrical lines, other Project features) incorporate the micrositing considerations and recommendations outlined in the Guidelines, as well as information developed during the Project's "pre-project assessment" surveys and "macrositing" exercises (USFWS 2009). While Iberdrola has committed to consider micrositing options to incorporate the Service's recommendations (Iberdrola 2010), the Service is concerned that the ASC does not reflect complete "macrositing" and "pre-project assessment" efforts, and recommendations provided in the Guidelines. The application for a site certificate should include: 1) habitat mapping and species surveys including Washington ground squirrel surveys, raptor nest surveys, and avian point counts consistent with the Pre-Project Assessment phase of the Guidelines; 2) an assessment of project impacts; and 3) a habitat mitigation proposal, including a calculation of habitat mitigation acreages.

Response

1. Habitat mapping and species surveys results are provided in Exhibits P and Q. Detailed information about the Facility area is provided in the ASC. Some biological data are site-specific and were used by IBR to design the layout several months prior to submittal of the ASC. IBR is committed to implementing measures (such as the 785-foot buffer from WGS colonies) to avoid, minimize, and mitigate potential impacts. The WGS surveys will be conducted in the proper season and in accordance with the Oregon Columbia Plateau Ecoregion Wind Energy Siting and Permitting Guidelines, before construction. The extensive 2010 survey data will also be used for further facility micrositing. The 2010 survey year is closer to construction than 2008 and the data more "fresh."

2. An assessment of project impacts is provided in Exhibits P and Q and in the proposed habitat mitigation plan (HMP). [Note: To avoid confusion with the later revised version of this plan, included in the Supplement as Attachment P-6, the RAC2 version is not attached.]

3. The HMP, including a calculation of habitat mitigation acreages, is provided in RAI Attachment 7. [Note: To avoid confusion with the later revised version of this plan, included in the Supplement as Attachment P-6, the RAC2 version is not attached.]

Comment USFWS RAC3

During the NOI phase of the Project, the Service made recommendations for the amount and type of mitigation necessary for temporary and permanent impacts to wildlife habitat, significant displacement of wildlife populations, and other wildlife impacts that result from the proposed Project (USFWS 2009). Iberdrola has since committed to working with ODFW and the Service on mitigation options to incorporate these recommendations (Iberdrola 2010). We look forward to working with ODOE, Iberdrola, ODFW and other interested parties to develop adequate mitigation measures for impacts from the Project once the above referenced surveys are completed.

Response

The proposed HMP is provided in RAI Attachment 7. [Note: To avoid confusion with the later revised version of this plan, included in the Supplement as Attachment P-6, the RAC3 version is not included.]

Comment USFWS RAC4

During the NOI phase of the Project, the Service made recommendations to strategically assess and offset direct and cumulative impacts to birds and bats (USFWS 2009). In response, Iberdrola provided the report titled "Avian and Bat Cumulative Impacts Associated with Wind Energy Development in the Columbia Plateau Ecoregion of Eastern Washington and Oregon" prepared by WEST, Inc. (2008). This assessment notes that as wind energy development continues to expand, ferruginous hawks (*Buteo regalis*) collision mortality could eventually reach a point that populations may begin to decline without some form of mitigation. Ferruginous hawk, Swainson's hawk, Washington ground squirrel, and burrowing owl are already rare or exhibiting population and distribution declines. Failure to understand the cumulative impacts of this rapid wind project development expansion could contribute to population level impacts to species. Therefore, the Service continues to recommend that ODOE take the lead in initiating the cumulative impacts recommendations in the Guidelines.

Response

Noted.

Email of March 17, 2010: Revised Draft Habitat Mitigation Plan

From Sara Parsons/IBR to John White/ODOE on March 17, 2010, following e-mail of March 11, 2010, documenting conference call with Oregon Department of Fish and Wildlife:

During our call, you had a question about one of the sentences in Section IV. We've tried to clarify that sentence in the attached version of the HMP. [See Attachment P-6 for HMP.]

Within the 440-acre parcel, 252 acres have recently been protected by conservation easements in association with other wind energy projects including the Leaning Juniper II Wind Power Facility; the certificate holder has an option for establishing a conservation easement on the remaining 188 acres.

Email of March 24, 2010: Final Revised Draft of Figure Q-2c
[*confidential figure provided under separate cover in Attachment P-3*]

From: Parsons, Sara McMahon
Sent: Wednesday, March 24, 2010 4:49 PM
To: 'Steve Cherry'; 'John White'
Cc: 'Kara Warner'; 'kronner@NW-WildlifeConsultants.com'
Subject: RE: Montague - conference call with ODFW

We've revised the Figure Q-2c [confidential; provided under separate cover] we sent on Thu 3/11/2010 3:46 PM to show that the turbine string access road from Tree Lane to the GG turbine string would be constructed entirely outside the 785-foot buffer. Also, we had mistakenly applied the 785-foot buffer around WGS Site #13 in the ASC. This site is a single burrow like WGS Site #5 and #8. Any inconsistency between our map and application and ODFW December 3, 2009, guidance is limited to sites #5, #8 and #13. We will provide this map and clarifications in the response to RAIs, which we plan to send to John on Friday.

Emails of March 31 and April 2, 2010: Revised Draft Wildlife Mitigation and Monitoring Plan

From Sara Parsons/IBR to John White/ODOE:

Karen and I have reviewed the HMP and Reveg Plans and do not have any comments or concerns with those changes.

We also reviewed the WMMP changes, which look good as well. Karen brought up three points on the WMMP that I missed and did not include in the original WMMP we submitted to you and Steve. I think they are important enough that I wanted to bring them up.

- Number of days carcass remain. (Pg A-7, line 38 and A-8, lines 20-21). We think it should be 35 days, not 40, consistent with the rest of the plan and Helix' WMMP.

- Mitigation (Pg A-10, lines 15-16). We suggest adding habitat mitigation. IBR often secures larger-than-required habitat mitigation sites that protect wildlife habitat and benefit species that are found to be impacted during fatality monitoring.
- Raptor Nest Monitoring (Pg A-11, line 42). We would like to discuss changing 2-miles to ½ mile. The nests on lands not leased by the Project owner are challenging to monitor. Almost all of the adjacent landowners are signed up with other projects. Also, the Analysis section (Pg A-13, line 21) specifies 1/2 mile, so the benefit of surveying out to two miles is unclear.

I also received your e-mail about WGS and will be reviewing that with our team.

From Sara Parsons to John White on April 2, 2010:

Here's the WMMP with Karen's suggested changes to the raptor nest survey language she discussed with Steve. I also put in the other changes we discussed. Everything is highlighted in green. [See Attachment P-6.]

Email of April 20, 2010: Habitat Standard

Comment

On March 31, the Department sent an email to IBR outlining the policies for determining the location of Category 1 WGS habitat based on comments from ODFW. IBR has not commented on the March 31 email, and so we do not know whether IBR accepts this approach. We propose to develop a recommended site certificate condition that would incorporate the policies discussed in that email. The boundaries of Category 1 WGS habitat would be determined based on where the squirrels are active in the most recent squirrel season prior to the start of construction. This includes a 785-foot buffer around any active single-burrow WGS detections in that survey; however, single-burrow detections from previous years that are not active in the latest survey would not be considered Category 1.

Response

As we discussed on April 14 [by phone], your e-mail made sense to us. However, we would like to review the draft condition to make sure it is consistent with our understanding of the approach.

EXHIBIT R

Scenic and Aesthetic Values

RAI No. 1 (Responses dated March 29, 2010)

Comment R1

Were applicable State-level management plans omitted from Table R-1?

Response to R1

The identification of State-level management is not specified under OAR 345-021-0010(1)(r)(A). However, even if it were specified under OAR 345-021-0010(1)(r)(A), IBR's visual consultant, CH2M HILL, determined that no applicable State-level plans cover lands within the analysis area. For these reasons, Table R-1 contains only the local and federal plans that address lands within the analysis area.

Comment R2

The application states that the Roosevelt Community Subarea Plan contains two statements about visual resources. What do these statements say? Provide excerpts from the Plan showing the context of these statements.

Response to R2

The Roosevelt Community Subarea Plan includes two general statements about visual qualities in the plan area. The two statements do not define specific scenic resources or views. Excerpts from the Plan showing the context of these statements are provided below.

The first statement, located in the Conclusions subsection on page 9 of the Background and Inventory Report section, is a general statement about the natural features found in the subarea. The statement is as follows: "1. The natural features of the area: the hillsides, the long shoreline, the wet areas, the green alluvial plain, the broad spacious bench covered with grasses, and the irregular terrain covered with thick and thin soils over bedrock create an interesting and pleasing setting for people living in the area."

The second statement, located in the Residential subsection on page 11 of the Existing Land Use section, addresses Columbia River views from the platted residential lots in North Roosevelt and West Roosevelt. No specific views are identified. The statement is as follows: "In a more intensely used area this would be an inefficient use of land; however, in Roosevelt this is a positive land use pattern. These lots are used for gardens and storage sheds. They provide a pleasant open feeling with views of the river and a quiet setting."

Again, no specific scenic resources or views are identified.

Comment R3

Fourmile Canyon is identified as a "high-potential site." The location of the Fourmile Canyon BLM interpretive site is such that visitors are directed to a view of wagon ruts lying in a generally west or northwest direction from Fourmile Canyon Road. The ZVI analysis indicates that as many as 30 MWPF turbines could be visible from that location. In order to help the Council decide whether the visibility of turbines (even though at a distance) would have a significant adverse impact on the visual experience of the site, can IBR provide visual simulations of the turbines that would be visible from the interpretive site (using both 1.5-MW and 3.0-MW layouts)? The photograph in Attachment R-1 showing the view from the Fourmile site could be used as the basis for the simulation.

Response to R3

Attachment R-1 contains visual simulations of the turbines that would be visible from the Fourmile Canyon BLM interpretive site, using both the 1.5-MW and 3.0-MW layouts. The photograph showing the view from the Fourmile site was used as the basis for the simulations. One of the visual simulations in Attachment R-1 is of the approved Shepherds Flat turbines currently under construction. The Shepherds Flat turbines would be visible from the Fourmile Canyon BLM interpretive site, looking south, which demonstrates that there are other turbines visible from the "high-potential site."

Comment R4

IBR proposes to implement "best management practices" to minimize visual impacts of the facility. What are the best management practices that will IBR employ to reduce visual impacts? Do best management practices include maintenance of turbine towers (for example, periodic cleaning of turbine towers to remove oil or other fluid drips that may leak from nacelles)?

Response to R4

The best management practices referenced in the ASC Exhibit R Conclusion section (Section R.9) are presented in the Opportunity for Mitigation section (Section R.6), consistent with OAR 345-021-0010(1)(r)(D). IBR will incorporate a combination of these best management practices to minimize the proposed Facility's visual effects. The best management practices listed in Sections R.6 and R.9 related to visual effects do not include maintenance of the turbines such as cleaning of turbine towers to remove oil or other fluid drips. However, IBR will follow good housekeeping best management practices to maintain the Facility, including periodic cleaning of turbine towers to remove oil or other fluid drips that may leak from nacelles. Any cleaning will be consistent with measures described in Condition 84 of the *First Amended Site Certificate for the Leaning Juniper II Wind Power Facility* (November 20, 2009). IBR will ensure that there is no runoff of washwater from the site or discharges to surface waters, storm sewers, or dry wells. No acids, bases, or metal brighteners will be used with the washwater. Biodegradable, phosphate-free cleaners will be used sparingly.

Reviewing Agency Comments from Oregon Parks and Recreation Department

Comment RAC1

Upon review of the Scenic Resources (Exhibit R) section, we find that three OPRD properties were not included. We request that Arlington; John Day, Hildebrand; and Cottonwood Canyon State Park be included in the visual impact evaluation for this project.

Response

None of the three state parks currently has a management plan. According to OPRD (in a telephone communication between Jan Houck of OPRD and CH2M HILL on March 9, 2010), a master plan for Cottonwood Canyon State Park will be developed in summer 2010. Under OAR 345-021-0010(1)(r), the only scenic resources that are analyzed for purposes of Exhibit R are resources identified as significant or important in local land use plans, tribal land management plans, and federal land management plans. These three parks are not included in any local, tribal, or federal plan, and even if the parks were listed in a state-level management plan, the three parks would not be evaluated in Exhibit R since state-level management plans are not specified in OAR 345-021-0010(1)(r).

However, the Arlington and John Day (Hildebrand) parks are evaluated under Exhibit T, as indicated in the response to RAI2 below, to demonstrate that the Facility will have no negative impact on these recreational resources.

Email of March 24, 2010: Nighttime Lighting

From: Parsons, Sara McMahon
Sent: Wednesday, March 24, 2010 11:12 AM
To: White, John
Subject: RE: LJII - nightime lighting

Our construction site manager, Jay Anderson, has informed us of the need for nighttime lighting during construction of LJII. Night-time lighting will be needed to maintain the construction schedule during shorter winter days. The construction contractors will need to erect turbines at both LJIIA and LJIIB with a night crew. They should be able to erect at least 1 turbine per night with 1 crew. Based on the current construction schedule, they would need to use a night crew starting in early to mid September through the end of November, for a maximum of three months. The crews will need to work all night from 7 pm to 7 am.

To assist with the night time crew and other construction needs, Dennis Barker will serve as our second on-site construction site manger. Per condition 34, Dennis' contact information is as follows: Dennis.Barker@iberdrolausa.com, Telephone: (307) 321-7696.

We reviewed the compliance matrix and site certificate conditions with Jay Anderson, Dennis Barker and the construction contractors during the environmental training for the project. Jay, Dennis and the construction staff are aware of the requirements of the Conditions including, 92 and 93, and will ensure that any nighttime lighting used will be the minimum necessary for construction and will take measures to direct the light to illuminate only the work area. Lighting will only be used at the work location and only directed downward to illuminate the work area at the turbine base or upward from the base to

illuminate the turbine tower; construction lighting will not be directed outward. One of our on-site environmental compliance officers, Jay Anderson or Dennis Barker, will monitor the use of lighting during construction to ensure these requirements are being met.

From: White, John [mailto:john.white@odoe.state.or.us]
Sent: Wednesday, March 24, 2010 8:30 AM
To: Parsons, Sara McMahon
Subject: LJII - nightime lighting

Would you please send me an email confirming what you have told me by telephone regarding the need for nighttime lighting during construction of LJII. Please describe the types of construction operations that will need lighting, the approximate hours of night (all night, or how many hours after sunset or before dawn?), the duration (months) during which this would occur, and the reasons why nighttime construction work is necessary. Make sure that your construction contractors are aware of the requirements of Condition 92: any nighttime lighting must be the minimum necessary for construction, care must be taken to direct the light to illuminate only the work area, and the lights must be shielded or downward directed to reduce glare. Your on-site environmental compliance officer (Condition 34) should monitor the use of lighting during construction to ensure these requirements are being met.

Email Response of April 13, 2010: Recreation Standard

Comment

In response to RAI R3, IBR provided photo-simulations of the view from the BLM Oregon Trail interpretive wayside on Fourmile Road. For viewers looking west from the BLM wayside, parts of five proposed MWPF turbines would be visible behind the view of the ONHT ruts, as shown by the simulations.

The Council has previously found that the identified "important scenic value" value associated with the ONHT at the Fourmile Road site is the view of the visible remnants of the trail and the immediate surroundings on public land (*Final Order on Amendment #1 for the Leaning Juniper II Wind Power Facility*, p. 52). The Council, however, has not previously considered a wind energy facility in which proposed turbines would be located behind the view of the ONHT ruts. It is possible that the Council could make a finding under the Scenic Standard that the "important scenic value" of the Fourmile site extends to the horizon beyond the "immediate surroundings" of the visible ONHT ruts. Aside from the question of a scenic resource, however, we believe that the visibility of wind turbines located behind the view of the ONHT ruts would adversely affect the recreational opportunity of the site.

We believe that the ONHT interpretive site on Fourmile Road is an "important recreational opportunity" under the factors set out in the Recreation Standard. The Fourmile wayside location is designated as a "high-potential site" for public viewing and interpretation of the ONHT. The recreational opportunity is unusual because of the historic significance of the ONHT. Although opportunities to view developed areas of presumed ONHT trail alignments are common, opportunities to view visible remnants of the trail in locations

accessible to the public are rare and irreplaceable. Demand due to interest in the ONHT may be considered moderate.

Under the current MWPF layouts, wind turbines would be plainly visible on the horizon within the same line-of-sight or viewing angle from the perspective of viewers looking toward the visible remnants of the ONHT from the BLM interpretive site. We believe that these turbines would draw the viewers' attention away from the ONHT ruts, would interfere with the viewers' experience and enjoyment of the historic significance of the ONHT and would degrade the recreational value of the site.

IBR provided a photo-simulation showing that Shepherds Flat (South) wind turbines (already approved by the Council but not yet built) would be visible to viewers looking south from the BLM wayside. We will give the certificate holder an opportunity to confirm the accuracy of the photo-simulation. We assume that the Shepherds Flat South turbines would be visible, but they would not be located in the same direction as the ONHT ruts and would not occupy the background behind the view of the ruts from the interpretive site.

The Department compared the photo-simulation of the MWPF turbines with the proposed facility layouts (Figures C-5c and revised Figure C-7a) to determine which turbines are visible in the photo-simulations. It appears to us that the turbines shown in the photo-simulation of the 1.5-MW turbines are turbines in the V-string. We note that met tower PM3 is adjacent to this string, and we would be concerned about it being visible from the Fourmile site as well. We are uncertain what turbines are shown in the photo-simulation of the 3.0-MW turbines. Parts of five turbines are shown in the simulation, but there are only three turbines in the V-string shown in the 3.0-MW layout (revised Figure C-7a). Met tower PM3 is also part of the 3.0-MW layout.

To mitigate the potential adverse impact of the MWPF on the recreational value of the Fourmile ONHT interpretive site and to support a recommendation of compliance with the Recreation Standard, we believe that the site certificate should be subject to a condition requiring the certificate holder to microsite the MWPF components so that no turbine or met tower would be visible to viewers looking toward the ONHT ruts from the Fourmile interpretive site.

Response

There was an error in the photo-simulation of the 3.0-MW turbines. The 3.0-MW simulation mistakenly used the 1.5-MW maximum turbine layout with five turbines. However, the simulation did use the 3.0-MW turbine tip height. It would not be possible to microsite the MWPF components so that no turbine or met tower would be visible to viewers looking toward the ONHT ruts from the Fourmile interpretive site. The MWPF components would have to be shifted 2,300 to 3,000 feet to the west, which would result in them being placed on the side hill and in the valley. Due to the low wind resource in this low-lying area, the turbines would have to be dropped from the layout entirely, resulting in a loss of up to 9 MW. Further, moving these turbines does not eliminate from a viewer's perception other wind turbines in the vicinity of MWPF. While not directly behind the trail ruts, turbines from an adjacent project would be within the panoramic view from the Fourmile interpretive site.

It is IBR's position that the recreational value of the Fourmile ONHT interpretive site is not diminished by the presence of wind turbines in the viewscape, any more than it is diminished by other post-19th century human activity in the area including barns, farmhouses, silos, agricultural equipment, and commercial activity such as the Cecil General Store and Highway 74. However, IBR is willing to enhance the interpretive site as part of its overall construction activities and commitment to the community, similar to Condition 52 of the Klondike 3 Site Certificate. A condition similar to the following is proposed:

To offset any perceived adverse visual effects to the setting of the Oregon Trail alignment, the certificate holder shall enhance the existing Fourmile ONHT interpretive site or other Oregon Trail historical marker near the MWPF with an additional educational and interpretive display in coordination with the Oregon Trails Advisory Council.

Email Response of April 20, 2010: Scenic Resource Standard

Comment

In response to RAI R1, IBR stated "the identification of State-level management areas is not specified by OAR 345-021-0010(1)(r)(A)." IBR made a similar statement in response to RAI RAC2. These statements are incorrect. The language of OAR 345-021-0010(1)(r)(A) is based on the Scenic Resources Standard. The standard addresses "...resources and values identified as significant or important in local land use plans, tribal land management plans and federal land management plans for any lands located within the analysis area described in the project order." In this context, we have always interpreted "local management plans" to include State-level plans applicable to State-managed lands in the local area and not just management plans of local governments. "Local" here is used in a generic sense to mean any applicable management plan that is neither a tribal nor a federal management plan. Previous Council orders have routinely addressed State-level plans (see, for example, *Final Order on the Application for the Leaning Juniper II Wind Power Facility*, pp. 60-61, discussing State management of the John Day State Scenic Waterway).

Portions of the John Day State Scenic Waterway lie within the scenic resources analysis area for MWPF, as shown on Figure R-1. We propose to make the same recommended findings for MWPF as were made for Leaning Juniper II with regard to the John Day State Scenic Waterway.

Response

IBR concurs with ODOE's proposal to make similar findings for MWPF as were made for Leaning Juniper II with regard to the John Day State Scenic Waterway. The nearest MWPF turbine would be approximately five miles away from the segments of the John Day River that have been designated as Federal Wild and Scenic River and State Scenic Waterway. The ZVI maps show that the MWPF turbines would not be visible from viewpoints on the river. Portions of the John Day Wildlife Refuge are approximately 5 miles from the nearest MWPF turbine. The refuge is protected for wildlife habitat and is not managed for scenic views. Based on the ZVI maps, some MWPF turbines might be visible from a small and relatively inaccessible area within the wildlife refuge approximately ¼-mile from the river bank.

EXHIBIT S

Cultural Resources

RAI No. 1 (Responses dated March 29, 2010)

Comment S1

Does IBR propose to "avoid" all of the sites listed in the application Section S.3.2 (pp. 3-8), regardless of NRHP eligibility status? Does "avoid" mean establishing a 50-foot buffer, as stated in proposed Condition 48 on p. 13? We will need to confirm with SHPO whether a 50-foot buffer is acceptable (SHPO requested a 30-meter buffer at Klondike).

Response to S1

That is correct. No facilities will be constructed within recorded archaeological sites regardless of NRHP eligibility status. Additional protection measures will also be implemented as described in the proposed condition shown below, which is similar to Condition 48 in the *First Amended Site Certificate for the Leaning Juniper II Wind Power Facility* (November 20, 2009):

Before beginning construction, the certificate holder shall label all identified historic, cultural, or archaeological resource sites on construction maps and drawings as "no entry" areas. If construction activities occur within 200 feet of an identified site, the certificate holder shall flag a 30-meter buffer around the site. The buffer will not extend into the County road right-of-way. No buffers will be required at operational farmsteads DS-1, JRC-8, and JRC-10. Existing private and public roads may be used without upgrades or widening within the 30-meter buffer around identified archaeological sites.

Comment S2

S-12 says that "archaeological monitors" will be present during construction in areas within 200 feet of the six cultural sites that have been identified as likely to be eligible for listing on the NRHP. The proposed conditions (taken from the LJII site certificate) do not address this. In a new condition, how should the qualifications of an "archaeological monitor" be described?

Response to S2

The statement in Exhibit S that archaeological monitors will be present was made in error. As proposed in the condition above (see response to S1), if construction activities occur within 200 feet of an identified site, a 30-meter buffer will be maintained. The buffer will provide adequate protection for the resource, thereby eliminating the need for an archaeological monitor.

Comment S3

Discuss the potential placement of facility components on or near sites that have been identified as "likely to be eligible for listing on the NRHP."

Turbine KK2 on Fig C-5c appears to be located on CH-09-05.

There appear to be road improvements sited on or near CH-09-07.

There appears to be a new turbine road (Fig C-5a) sited on or near CH-09-RM-2.

Turbines S8 and V5 on Fig C-5a (and turbine S5 on Fig C-7a) appear to be sited on CH-09-21-OR.Tr.

Response to S3

The facilities specified in the comment appear to be overlapping with stated sites because of the scale of the figures. No facilities will be constructed within recorded archaeological sites regardless of NRHP eligibility status. The site boundaries will be further protected with a buffer as described in the proposed condition above (see response to S1).

Project facilities will be routed around sites CH-09-05, CH-09-07, and CH-09-RM-2. The boundaries of these sites will be protected with a 30-meter buffer. Each site will be marked in the field with high-visibility stakes or pin flags and posted with a "no entry" sign, as described in the proposed condition.

The Oregon Trail location shown in Figure 3 is approximate. No Facility components will be located on CH-09-21-OR.Tr. The locations of the intact segments of the Trail as recorded during the cultural resources investigation are shown in new (confidential) Figures 3a and 3b in the revised *Cultural Resources Survey for the Montague Wind Power Facility* (see confidential Attachment S-1). Elsewhere within the site boundary, visible remnants of the Trail have been destroyed by road construction and agricultural cultivation. CH-09-21-OR.Tr will be avoided by all Facility construction and operation. The Trail will be marked in the field with high-visibility stakes or pin flags and posted with a "no entry" sign, consistent with a site certificate condition similar to Condition 103 in the *First Amended Site Certificate for the Leaning Juniper II Wind Power Facility* (November 20, 2009):

In reference to the approximate alignment of the Oregon Trail described in the ASC, the certificate holder shall comply with the following requirements:

a) The certificate holder shall not locate facility components on visible remnants of the Oregon Trail and shall avoid any construction disturbance on those remnants.

b) The certificate holder shall not locate facility components on undeveloped land where the trail alignment is marked by existing Oregon-California trail Associated markers, as described in the ASC.

c) Before beginning construction of the Montague components as described in the ASC, the certificate holder shall provide to the State Historic Preservation Office (SHPO) and the Department photographic documentation of the presumed Oregon Trail alignments within the site boundary.

d) *The certificate holder shall ensure that construction personnel proceed carefully in the vicinity of the presumed alignments of the Oregon Trail. If any intact physical evidence of the trail is discovered, the certificate holder shall avoid any disturbance to the intact segments by redesign, re-engineering, or restricting the area of construction activity. The certificate holder shall promptly notify the SHPO and the Department of the discovery. The certificate holder shall consult with the SHPO and the Department to determine appropriate mitigation measures.*

Reviewing Agency Comments from State Historic Preservation Office and Confederated Tribes of the Umatilla Indian Reservation

Please refer to Attachment S-1 [confidential] for comments and responses.

Email Response of April 20, 2010: Cultural Resources Standard

Comment

The Historic, Cultural and Archaeological Resources Standard is not applicable to site certificate eligibility under ORS 469.501(4), but the Council may impose site certificate conditions based on the requirements of the standard. We anticipate that we will recommend site certificate conditions for the MWPF similar to those previously adopted by the Council for the protection of cultural resources. IBR has provided revised information about cultural resources in response to comments from SHPO (RAC4) and CTUIR (RAC6). We will take into consideration any further comments we receive from SHPO or CTUIR in making our recommendations for site certificate conditions.

We have been advised by SHPO that additional cultural resource information may be required in connection with the USACE's Section 404 permit (March 26, 2010, email from SHPO is being forwarded to IBR with this memo). IBR discusses the Section 404 permit in Exhibit J of the application. SHPO notes that under Section 106 of the National Historic Preservation Act, USACE is obligated to take into account, prior to the project activity, any effect that the activity may have on historic properties, including historic structures, districts, archaeological sites, and Traditional Cultural Properties. USACE and SHPO will have to agree upon the project's area of potential effect (APE), which includes areas that would be directly and indirectly affected by the project activity. This may include areas outside of the proposed MWPF site boundary and outside the study area addressed in the cultural resource report submitted by IBR.

The applicant is obligated to document (for USACE) all historic properties within the APE, regardless of whether they believe there will be an effect. We believe that the federal process under Section 106 of the NHPA (identifying historic properties, determining eligibility for listing in the NRHP, additional field studies if necessary, consultation, and seeking

Response

IBR understands the issues raised in this comment and is working with the U.S. Army Corps of Engineers and the State Historic Preservation Office. IBR will keep the Oregon Department of Energy informed regarding the issues raised by USACE and SHPO.

Email Response of April 20, 2010: Cultural Resources Sites and Isolates

Comment

In Exhibit S, the findings are described as: "23 sites, including 19 archaeological sites, three farmsteads, and two visually intact remnants of the ONHT comprising a single site. In addition, the Applicant recorded 22 archaeological isolates." In Section S.3.2, twenty-three sites are listed.

In the cultural survey report, the findings are described as 24 sites and 20 isolates (pages 5-2 and 5-9).

Response

At the request of SHPO, two isolates (IF-21 and IF-JRC-5) were changed to sites.

Comment

Table 5-1 in the report lists 24 sites, but does not include "CH-09-06", which is one of the sites listed in Exhibit S, Section S.3.2. Also, there are two sites listed in the report that are not included in the list of 23 sites in the Exhibit ("IF-21" and "IF-JRC-5").

Response

At the request of SHPO, "CH-09-06" was deleted from the site record. IF-21 and IF-JRC-5 were formerly isolates, converted to sites.

Comment

Table 5-2 lists 20 isolates. The exhibit text says there are 22 isolates, but does not list them. I want to put the correct number of isolates in the draft proposed order.

Response

The correct number of isolates goes from 22 to 20, as a result of IF-21 and IF-JRC-5 being converted to sites.

Email of April 21, 2010: Response to SHPO Letter on Ranch Structures

Please refer to confidential Attachment S-1 provided under separate cover.

Email of April 21, 2010: Response to SHPO Request for Table of Site Protection Measures

Please refer to confidential Attachment S-1 provided under separate cover.

EXHIBIT T

Recreation

RAI No. 1 (Responses dated March 29, 2010)

Reviewing Agency Comment from Oregon Parks and Recreation Department

Comment RAC2

Two OPRD properties were not included in the Recreation Facilities (Exhibit T) section. These properties are Arlington and John Day (Hildebrand). We request that those properties be identified and evaluated.

We have attached a map showing the OPRD properties colored orange. (See Attachment T-1.)

Response

A revised Figure T-1 showing the Arlington State Park and John Day (Hildebrand) State Park is attached to this response table. (See Attachment T-1.)

The following information regarding these two parks was provided to CH2M HILL in a personal communication with Jan Houck, ORPD, on March 9, 2010:

Arlington State Park. This park is a wayside that is an open space along the highway (I-84) intended to provide a visual buffer area for travelers to stop and take photos of the surrounding landscape. The wayside is undeveloped and there are no amenities or structures. There is no management plan for this park or wayside.

John Day (Hildebrand) State Park. This is an undeveloped property along the John Day River Scenic Waterway that is for boating access only. It is open to the public but is only accessible by the river (otherwise landlocked by private property). Only river users can access it. There is no management plan for this park.

While each of these parks provides recreational opportunities such as boating access and day use, the recreational opportunities are common and replaceable. As determined by EFSC for the previously approved Leaning Juniper II Wind Power and Shepherds Flat projects regarding other parks within the analysis area that provide similar recreational opportunities, these recreational opportunities do not meet the criteria set forth in OAR 345-022-0100 as "important." Therefore, further evaluation of Arlington State Park and John Day (Hildebrand) State Park in Exhibit T is not necessary to demonstrate that the Facility will have no significant adverse impacts on any important recreational opportunity within the analysis area.

Nonetheless, these two parks were included in a revised ZVI analysis and it was determined that the Facility turbines would not be visible from either park. A revised Figure R-1 is attached to this response table (see Attachment T-1). Thus, even though analysis of these

two parks was not required under Exhibit R (by rule), and even though further evaluation was is not required as a part of Exhibit T (because these parks are not "important" within the meaning of EFSC), the information provided in these responses demonstrates that the Facility will have no significant adverse impacts on any important recreational opportunity within the analysis area, including Arlington State Park and John Day (Hildebrand) State Park.

EXHIBIT U

Public Services/Socioeconomic Impacts

RAI No. 1 (Responses dated March 29, 2010)

Comment U1

The application states that some local and County roadways may require improvement before construction can begin. Figures C-5a through C-5d show "proposed improved roads," some of which lie outside the site boundary. Are all proposed improvements to local and County roadways restricted to the roads shown on these figures and marked as "proposed improved roads?"

Confirm whether all improvements to County roads would be restricted to areas within the County rights-of-way, would be subject to approval by the County and would conform to County road design standards.

Discuss the potential for listed or special-status plant species to be affected by the proposed improvements to local and county roadways.

Will any improvements or modifications to State roads or highways be needed?

Response to U1

Yes, the proposed improvements to local and County roadways are shown in ASC Figures C-5a through C-5d as "proposed improved roads."

Improvements to County roads will be restricted to areas within the County rights-of-way and therefore will be subject to approval by the County and conformance with County road design standards. County roads, including the unimproved right-of-ways, are zoned and designated for road purposes. Therefore, consistent with ODFW's approach for WGS, no additional survey work is required within the right-of-way for listed or special-status plant species.

Modifications to State roads or highways may also be needed. For example, modifications may be needed at the intersection of Highway 19 with Tree Lane, Weatherford Lane, Montague Road, new access road south of Tree Lane, and on a private road to the proposed O&M building, as shown in revised Figure U-2 in Attachment U-1. Any modifications would be entirely within the County and State rights-of-way. IBR will contact the Oregon Department of Transportation (ODOT) to schedule a site visit to review approaches onto Highway 19 and will confirm the necessary permits. Permits needed for this project relevant to the approaches for Highway 19 are anticipated to be the same as those required for the nearby Pebble Springs and Leaning Juniper II projects:

- Permit to Construct a State Highway Approach
- Permit to Operate, Maintain, and Use a State Highway Approach

Written confirmation from ODOT will be provided to ODOE as soon as it is available.

Comment U2

What was considered a "commutable distance" in the analysis of housing availability?

Response to U2

A commutable distance in the analysis of housing availability was assumed to be approximately 50 miles. This number was based on the distance from the Facility to the main public service providers (such as, for example, the cities of The Dalles and Goldendale).

Comment U3

The letter from Gilliam County Fire Services states that the North Gilliam County RFPD is not equipped to provide confined space or high angle rescue services. If these types of rescue are needed at the site, how would they be provided?

Response to U3

IBR recognizes that the local fire authority does not have the proper training or capability to perform high-angle rescue. As included in the site certificate application for Leaning Juniper II, at the beginning of Facility operation, the IBR will provide to the North Gilliam County Rural Fire Protection District and the Arlington Fire Department copies of the approved site plan indicating the identification number assigned to each turbine and the location of all Facility structures. During operation of the Facility, IBR will provide to the North Gilliam County Rural Fire Protection District and the Arlington Fire Department the names and telephone numbers of Facility personnel available to respond on a 24-hour basis in case of an emergency on the Facility site.

During Facility construction, IBR's construction contractors will utilize personnel that are trained and equipped for tower rescue and are first aid and CPR certified. In the event of an accident or medical emergency, these personnel will perform the rescue of personnel to the ground.

During Facility operation, IBR's operations personnel will be trained and equipped to perform tower rescue for tower-related emergencies. Operations personnel will be first aid and CPR certified. First aid kits will be taken up each tower during maintenance procedures and will be available to crew personnel during troubleshooting activities. In the event of an accident or medical emergency, these personnel will perform the rescue of personnel to the ground.

Once the Facility is operational, IBR intends to hold an annual meeting with North Gilliam County Rural Fire Protection District and the Arlington Fire Department to discuss emergency planning. If IBR conducts an annual emergency drill or performs tower rescue training at the Facility, the North Gilliam County Rural Fire Protection District and the Arlington Fire Department will be invited to observe.

Follow-up Comment (Informal RAI)

IBR proposes to provide the North Gilliam County Rural Fire Protection District with the final site plan and 24-hour emergency contact numbers. Given that the proposed facility borders Morrow County, contact the Ione Rural Fire District and find out if they want to have the same information.

IBR Response

On March 11, 2010, CH2M HILL contacted Virgil Morgan (Fire Chief of the Ione Rural Fire District), on behalf of Iberdrola Renewables, Inc. (IBR). Mr. Morgan indicated that his district collaborates with the North Gilliam County Rural Fire Protection District on a regular basis, and he would appreciate being sent the same information.

Mr. Morgan's contact information is as follows:

Fire Chief Virgil Morgan
P.O. Box 322
Ione, OR 97843
Telephone 541.422.7504
Cellular: 541.256.0256

Comment U4

Proposed Condition 36 addresses possible road damage to Gilliam County roads. Page U-4, however, discusses the use of Fairview Road as an alternate route for construction vehicles. Shouldn't the condition apply to Morrow County as well?

Response to U4

Yes, Condition 36 should apply to both Gilliam and Morrow counties if Morrow County roads are used during construction. The suggested revised language is as follows:

The certificate holder shall cooperate with the Gilliam County Road Department and Morrow County Road Department (if Morrow County roads are used), to ensure that any unusual damage or wear to County roads that is caused by construction of the Facility is repaired by the certificate holder. Upon completion of construction, the certificate holder shall restore county roads to preconstruction condition or better, to the satisfaction of the County Road Departments.

Comment U5

Proposed Condition 38 needs clarification. What does the phrase "except while in use" mean in reference to "parked or stored" equipment or machinery? Does this exception apply to County roads outside the site boundary?

We acknowledge that this condition language exists in the LJII site certificate, and we think that clarification would helpful for both Montague and LJII.

Response to U5

The suggested revised Condition 38 language is as follows:

The certificate holder shall ensure that no equipment or machinery is parked or stored on any county road within and outside of the site boundary. The certificate holder may temporarily park equipment off the road but within the County right-of-way as long as such temporary parking practices are coordinated with the County Roadmaster.

EXHIBIT V

Waste Minimization

Email of February 4, 2010: Soil Extension Service Letters

From: Parsons, Sara McMahon
Sent: Thursday, February 04, 2010 3:55 PM
To: 'John White'
Subject: Montague - Letter from OSU

When we originally began scoping the permitting of Montague, CH2M Hill requested updates from the OSU extension offices for both Morrow and Gilliam counties. We received the two attached letters in response to that request. (See Attachment V-1.)

Sandy Mcnabb (on behalf of OSU-extension service Sherman County) says that the project is outside his normal work area, but because the project is on dryland wheat, he could provide some general comments.

Jordan Maley, the OSU extension agent from the Gilliam county OSU-extension office also provided a letter, which is more specific and applicable to the project considering that the project is now located entirely within Gilliam county. Given that Maley's letter is more specific to dryland cropping in Gilliam county, we view it as essentially replacing the Macnab comment letter, although we appreciate Sandy taking the time to provide comments and will continue to work with him in the future for any of our projects within in his geographic area.

RAI No. 1 (Response dated March 29, 2010)

Comment V1

The application discusses a *variance* under OAR 340-093-0080(1) or a *permit exemption* under OAR 340-093-0080(2). Explain whether IBR is asking for a variance (and provide support for the request explaining why a variance should be granted) or, alternatively, a permit exemption. If IBR is asking for a permit exemption, provide, if possible, concurrence from DEQ that the proposed disposal of waste concrete on site would be exempt from the permit (email confirmation is acceptable).

Note that this same issue came up in the Helix application and was addressed by RAI#1 Request G-1. IBR's response at that time (after consultation with DEQ) was that neither a variance nor an exemption would be requested.

Response to V1

No variance or exemption will be requested or required for the Facility, consistent with the approach employed for the Helix Wind Power Facility (which, as ODOE notes, is described

in IBR's response to Request G-1 in RAI #1). This language in the Montague ASC was an error.

EXHIBIT W

Facility Retirement and Restoration

Informal RAI (Response dated March 12, 2010)

Comment

Explain the difference between the acreage of temporarily disturbed areas listed in Table W-1 (1821 total acres) and the acreage (2070 total acres) in Table C-3.

Response

The total disturbed acreage in Table C-3 (2070 acres) differs from the disturbance listed in Table W-1 because the temporary disturbance from the underground collector system was not included in the decommissioning calculation shown in Table W-1. The underground collection system will not be removed, and is therefore not accounted for in the decommissioning cost estimate.

RAI No. 1 (Responses dated March 29, 2010)

Comment W1

How many gallons of oil and antifreeze are contained in each turbine (maximum amount for the range of turbine types that could be used at Montague)?

Response to W1

The maximum amount of oil contained in the turbines proposed at the Montague Facility ranges from 83 to 304 gallons. These oils are located in the gearboxes, braking systems, and control systems, with the majority being located in the gear box. Gear box oil is analyzed frequently to determine its quality and continuing utility. Oil is replaced when tests reveal that it is necessary. With improved filtration technology, oil can be used for up to five years before being replaced. Historic frequency indicates that oil is typically changed every three years and hydraulic fluids are changed every two years.

The maximum amount of antifreeze contained in the turbines proposed at the Montague Facility ranges from 3.6 to 6 gallons.

Comment to W2

What is the maximum length and number of wires (per tower) connecting the pad-mounted transformer to the tower?

Response to W2

The maximum length and number of wires would be 20 feet and 26 wires per tower. This number includes power cable, ground wires, and fiber optic cable running from the control panel inside the base of the turbine tower to the generator step up transformer adjacent to tower. The lateral distance between the pad-mounted transformer and the tower would be approximately 5 feet, as shown in Figure B-3.

Comment W3

The application requests two major departures from the way the Council has addressed financial assurance: a "phase-in" of the requirement (starting in year 15 of operation) and an offset for scrap or salvage value in the calculation of the financial assurance amount. The phase-in would probably require a change in the Council's rules and a scrap offset has previously been rejected by the Council. Confirm for the record whether IBR wants to pursue either of these issues for Montague.

Response to W3

IBR understands the Council has previously indicated that no credit for scrap or salvage value be considered in determining the appropriate site restoration cost under OAR 345-022-0050. IBR has decided not to pursue either of these issues within the Montague ASC. IBR does, however, reserve the right to petition the Energy Facility Siting Council, outside of the Montague application process, for a policy or rule change that would better align the decommissioning security requirements imposed on wind projects with their real value.

EXHIBIT X

Noise

Email of March 10, 2010: Confidential Noise Submission

From: Albrich, Elaine [mailto:ERALBRICH@stoel.com]
Sent: Wednesday, March 10, 2010 11:14 AM
To: Tom Stoops
Cc: John White; Parsons, Sara McMahon; Carrie.Konkol@ch2m.com; Filippi, David; Albrich, Elaine; Mark.Bastasch@CH2M.com
Subject: PROTECTED NOISE DATA SUBMISSION: Iberdrola, Montague Wind Power Facility

Please find attached Iberdrola's submission of protected noise data for the Montague Wind Power Facility. A hard copy will follow by mail. (See Attachment X-1.)

Elaine R. Albrich

STOEL RIVES LLP | 900 SW Fifth Ave, Suite 2600 | Portland, OR 97204-1268

RAI No. 1 (Responses dated March 29, 2010)

Comment X1

X-3 discusses the fact that the facility would be located on private land under "long-term wind energy leases." We believe a condition similar to Condition 102 in the Helix site certificate should be included in the Montague site certificate. This would require a complaint response system during operation. We believe that the Council can require the certificate holder to monitor and record noise levels (see OAR 340-035-0035(4)(a)). A complaint system would be undermined if the wind lease agreements with the landowners contain language that would inhibit the landowners from raising complaints about facility noise. Do the lease agreements contain such language?

Response to X1

IBR is agreeable to a condition similar to Condition 102 in the Site Certificate for Helix, dated July 31, 2009.

There is no language in IBR's underlying wind leases that would prevent IBR from ensuring that the Facility complies with DEQ noise regulations, including the ability to address complaints from landowners that the Facility exceeds maximum DEQ noise levels.

Comment X2

Provide the manufacturers' sound power level reports for the two turbines included in the noise analyses.

Response to X2

Attachment X-1 (CONFIDENTIAL) contains sound power level test reports for the GE 1.5-MW and Vestas 3.0-MW turbines.

While the 3.0-MW Vestas turbine is not currently in production, its noise level represents the loudest turbine that would be considered for this Facility.

Comment X3

Provide a spreadsheet showing the sound pressure level contributed by all turbines included in the prediction of overall sound pressure level at each noise sensitive receptor along with the amount of ground attenuation and atmospheric absorption included in the prediction of sound from each turbine.

Response to X3

Attachment X-1 contains confidential spreadsheets showing the per turbine sound pressure levels at each receptor for the 1.5- and 3.0-MW layouts.

Ground attenuation and atmospheric absorption were calculated in accordance with the methods previously requested by the Department. The ISO 9613-2 Simple Ground Method provides for a maximum attenuation of 4.8 dBA per equation 10 of the standard. Table X3-1 provides predicted ground attenuation sound levels (dBA) at various distances for the two hub heights.

TABLE X3-1

Predicted Ground Attenuation Quantities for Facility Turbines

	Ground Attenuation (dBA)	
Distance (ft)	**80-meter Hub Height**	**50-meter Hub Height**
984	0.0	0.0
1640	2.0	1.3
3281	3.4	3.1
4921	3.9	3.7
6562	4.1	3.9
9843	4.3	4.2

Similarly, ISO 9613-1 (and -2) define atmospheric absorption for the requested temperature (10°C) and humidity (70 percent), conditions that favor propagation. Table X3-2 provides predicted atmospheric absorption frequencies (Hz) at various distances for the two hub heights.

TABLE X3-2

Predicted Atmospheric Absorption for Facility Turbines

	Octave Band Center Frequency (Hz)							
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
Distance (ft)								
984	0.03	0.12	0.3	0.57	1.11	2.91	9.84	35.1
1640	0.05	0.2	0.5	0.95	1.85	4.85	16.4	58.5
3281	0.1	0.4	1	1.9	3.7	9.7	32.8	117
4921	0.15	0.6	1.5	2.85	5.55	14.55	49.2	175.5
6562	0.2	0.8	2	3.8	7.4	19.4	65.6	234
9843	0.3	1.2	3	5.7	11.1	29.1	98.4	351

EXHIBIT AA

Other Information

RAI No. 1 (Responses dated March 29, 2010)

Reviewing Agency Comments from Public Utilities Commission

Comment RAC1

Applicant in constructing the subject facility will become an "operator" of electrical supply lines (i.e., power lines) and is subject to the Oregon PUC's (OPUC's) safety rules in Chapter 860, Division 024 of the Oregon Administrative Rules (OAR). Per OAR 860-024-0010, every operator shall construct, operate, and maintain electrical supply and communication lines in compliance with the standards prescribed National Electrical Safety Code (NESC). Applicant should also note responsibilities covered in OAR 860-024-0000, 860-024-0001, 860-024-0005, 860-024-0007, 860-024-0010, 860-024-0011, 860-024-0012, 860-024-0015, 860-024-0016. Refer to ORS 757.035 for OPUC statutory authority.

Response

IBR recognizes that the Oregon Public Utility Commission (OPUC) defines IBR as an operator for purposes of OPUC's safety standards set forth in OAR chapter 860, division 024. However, IBR is not an operator or a utility for the purposes of the Federal Energy Regulatory Commission (FERC) or the North American Electric Reliability Corporation (NERC).

Comment RAC2

Before project design and construction, brief the OPUC Safety Reliability Security Staff as to how it will comply with OAR Chapter 860, Division 024 during design, construction, operation, and maintenance and on an ongoing basis.

Response

Before Facility construction, IBR will coordinate with OPUC to ensure that transmission line designs and specifications are consistent with applicable codes and standards, consistent with the Leaning Juniper II SC condition 79.

Comment RAC3

When the project is put into service, brief the OPUC Safety Reliability Security Staff as to how operator of the project it will comply with OAR Chapter 860, Division 024 on an ongoing basis considering future operations, maintenance, emergency response, and alterations until project retirement. As part of the briefing, provide OPUC Safety Reliability Security Staff with the following:

Name of qualified person, including contact information, who will be responsible for the operation, maintenance, and safety of the electrical supply system (e.g. power lines) on an

ongoing basis. This person will serve as OPUC Safety Reliability Staff's contact who will give permission for applicable Staff inspections, audits, and other liaison.

Response

IBR will provide the Department with the emergency contact information for the Facility, the name of the qualified person overseeing the Facility's ongoing operation, and a copy of the final Facility layout as required by Conditions 2 and 34.

Comment RAC4

Name of the person and organization, including contact information, responsible for receiving emergency notifications and responding to imminent conditions per OAR 860-024-0012(1).

Response

IBR will provide the Department with the emergency contact information for the Facility, the name of the qualified person overseeing the Facility's ongoing operation, and a copy of the final Facility layout as required by Conditions 2 and 34.

Comment RAC5

Map of the final routes and installation of electrical supply lines showing:

- Transmission lines and structures (over 50,000 Volts)
- Distribution lines and structures—differentiating underground and overhead lines (over 600 Volts to 50,000 Volts)
- Substations, roads, and highways

Response

IBR will provide the Department with the emergency contact information for the Facility, the name of the qualified person overseeing the Facility's ongoing operation, and a copy of the final Facility layout as required by Conditions 2 and 34.

Comment RAC6

Provide plan and profile drawings of the transmission lines.

Response

IBR will provide the Department with the emergency contact information for the Facility, the name of the qualified person overseeing the Facility's ongoing operation, and a copy of the final Facility layout as required by Conditions 2 and 34.

Email Responses of April 20, 2010: Magnetic Field Strength

Comment 2a

2a. Table AA-2 and Table AA-3 give the calculated magnetic field strengths for the 230-kV lines (Central to Slatt and West sub to Central sub). In [ASC] Attachment AA-2, IBR has provided the data output for the EMF modeling. The data sets "230CBPAM" and "230CBPAH" appear to relate to Table AA-2, and the remaining two data sets appear to relate to Table AA-3. In Table AA2, for example, a magnetic field of 126.9 mG at centerline is shown for the monopole configuration. In [ASC] Attachment AA-2, the 230BPAM data for magnetic field shows 126.86 for the "Major Axis (mG)" at centerline. Assuming that this figure that was rounded up to 126.9 for Table AA-2, can you explain why the "Major Axis" value is used, rather than the "RMS Resultant (mG)"—which is 137.36 at centerline according to the 230BPAM data?

Response

This was an error. The maximum field strength should be the RMS resultant (mG) which is 137.36 or rounding off 137.4 mG. This is the vector sum of the field strengths in each of the three axes (x, y, and z) where the 126.9 mG is the highest field strength within one of these three axes. The correct number is 137.4 mG, the resultant vector sum.

Comment 2b

2b. Also, I note that the greatest magnetic field strength according to the 230BPAM data is not at centerline, but instead at +5 feet.

Response

The monopole design has two phase conductors on one side of the pole and one conductor on the other. The magnetic field is offset slightly to the side of the monopole structure where the two phase conductors are located.

EXHIBIT BB

Other Information

RAI No. 1 (Response dated March 29, 2010)

Comment BB1

In what ways has IBR "adjusted the locations of facility components to reduce the potential visual impacts to the ONHT?"

Response to BB1

IBR avoided placing facilities on intact segments of the trail as discussed in Exhibit S of the ASC. Below is a summary of specific layout adjustments that were made to avoid impacts to cultural resources, including reducing the potential visual impacts to the ONHT. Refer to the new confidential Figures 3a and 3b in Attachment S-1 for an illustration of these facilities in relation to the archaeological sites and intact segments of the Trail.

- Turbine S8 was shifted to the west
- Turbine C7 was shifted to the west
- A turbine between LL6 and LL5 was moved

Collectors, roads, and or staging areas around these turbines were also shifted to avoid impacts:

- Between V4 and V6
- Between S7 and S8
- Between WW2 and XX2
- Around turbine C7
- Between LL5-LL6
- Around L1 to M2
- Between KK1 and KK2
- Between E6 and E7 east
- Road to X string
- Roads between TT1, KK1, and the HH1 string

ATTACHMENT A-1

Montague LLC Articles of Organization

Articles of Organization

Secretary of State
Corporation Division
255 Capitol Street NE, Suite 151
Salem, OR 97310-1327
Phone:(503)986-2200
Fax:(503)378-4381
www.filinginoregon.com

Registry Number: 680326-98
Type: DOMESTIC LIMITED LIABILITY COMPANY

FILED
Apr 14, 2010
OREGON
SECRETARY OF STATE

1) ENTITY NAME

MONTAGUE WIND POWER FACILITY, LLC

2) DESCRIPTION OF BUSINESS

551112 - Offices of Holding Companies, Other

3) MAILING ADDRESS

ATTN PARALEGAL
1125 NW COUCH ST STE 700
PORTLAND, OR 97209
USA

4) NAME & ADDRESS OF REGISTERED AGENT

003292-27 - C T CORPORATION SYSTEM
388 STATE ST STE 420
SALEM, OR 97301
USA

5) ORGANIZERS

448526-89 - IBERDROLA RENEWABLES, INC.
1125 NW COUCH ST STE 700
PORTLAND OR 97209
USA
Authorized Signer: W BENJAMIN LACKEY

6) MEMBERS

448526-89 - IBERDROLA RENEWABLES, INC.
1125 NW COUCH ST STE 700
PORTLAND OR 97209
USA

7) DURATION

perpetual

8) MANAGEMENT

This Limited Liability Company is member managed.

9) PROFESSIONAL SERVICES

None

By my signature, I declare as an authorized authority, that this filing has been examined by me and is, to the best of my knowledge and belief, true, correct, and complete. Making false statements in this document is against the law and may be penalized by fines, imprisonment, or both.

By typing my name in the electronic signature field, I am agreeing to conduct business electronically with the State of Oregon. I understand that transactions and/or signatures in records may not be denied legal effect solely because they are conducted, executed, or prepared in electronic form and that if a law requires a record or signature to be in writing, an electronic record or signature satisfies that requirement.

10) ELECTRONIC SIGNATURES

W BENJAMIN LACKEY

Articles of Organization

Secretary of State
Corporation Division
255 Capitol Street NE, Suite 151
Salem, OR 97310-1327
Phone:(503)986-2200
Fax:(503)378-4381
www.filinginoregon.com

Registry Number: 680326-98
Type: DOMESTIC LIMITED LIABILITY COMPANY

FILED
Apr 14, 2010
OREGON
SECRETARY OF STATE

11) CONTACT NAME
EVANGELINE KESSLER

DAYTIME PHONE NUMBER
503-478-6305

ATTACHMENT B-1

Figure C-3a
Facility Location Map with LJIIB Overlap

Figure C-3a

Facility Location Map with Leaning Juniper IIB Overlap - Zoom to Overlap

1.5-MW Turbine Layout
(Maximum Turbine Layout)

Montague Wind Power Facility

- Proposed Turbine - Leaning Juniper II Request for Amendment #1
- Site Boundary
- Site Boundary - Overlap with Leaning Juniper IIB
- Micrositing Corridor
- Approved Addition to Leaning Juniper II Site Boundary for LJIIB
- Approved Addition to Leaning Juniper II Micrositing Corridor for LJIIB

Proposed Permanent Facilities

- Proposed Turbine
- Proposed Met Tower
- Proposed Access Road
- Proposed Underground 34.5-kV Line
- Proposed Overhead 34.5-kV Line
- Proposed 230-kV Transmission Line
- Alternate 1 230-kV Transmission Line
- Alternate 2 230-kV Transmission Line
- Proposed 5-Acre Facility Collector Substation
- Proposed 10-Acre O&M Facility and Staging Area
- Alternate 10-Acre O&M Facility and Staging Area

Existing Facilities

- Existing Transmission Line
- Public Road
- Private Road
- Major Railroad Line
- Streams
- State Boundary
- BPA Slatt Interconnection Substation
- County Boundary

0 0.5 1
Miles

N W E S

IBERDROLA RENEWABLES

File Name: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\RAI\Figure C-3a - Facility Location Map with LJIIB Overlap - Zoom to Overlap.mxd

Modified Date: 3/11/2010

ATTACHMENT C-1

Disturbance Tables and Figures

– *Revised Tables C-2 and C-3, Disturbance Calculations*
– *Revised Figures C-6 and C-7*

TABLE C-2. MONTAGUE DISTURBANCE CALCULATIONS—PERMANENTLY DISTURBED AREAS

Facilities	Notes	Units of Measurement	Montague			
			Dimensions per Unit	Number of Units	Acres	Miles
Turbine Pads/Towers	1	Square feet per tower	1,660	269	10.25	
Substation/O&M Facility						
Collector Substations	2	Acres	5	2	10	
O&M Facility(s)	3	Acres	3	2	6	
Meteorological Towers (self-supporting)	4	Square feet per tower	900	8	0.17	
Central Electrical System						
Overhead 34.5-kV Collector Line Structures	5,6	Square feet per 2-pole location	24	720	0.397	
230-kV Transmission Line between Montague Collector Substations						
Overhead 230-kV Collector Line Structures	7	Square feet per 2-pole location	40	86	0.079	
"Home Run" from Montague Collector Substations to Interconnection (230-kV route)						
Overhead 230-kV Collector Line Structures	8	Square feet per 2-pole location	40	93	0.085	
Access Roads and Turnarounds						
Improved Existing Roads to 20 feet (except county roads)	9	Feet of width per linear foot	10	26,974	6.19	5
Improved Existing County Roads to 30 feet (within county ROW)	10	Feet of width per linear foot	14	102,130	32.8	19
New 20-foot turbine string roads and road to met tower(s)	11	Feet of width per linear foot	20	365,876	168.0	69
New 27-foot turbine spur roads	12	Feet of width per linear foot	20	7,263	3.3	1
Total Permanently Disturbed Area					237.3 acres	

Notes: This table is based on the maximum layout facility component locations as shown on Figures C-4 and P-11, and the largest footprint for each facility based on the range of turbine types and support structures under consideration.

1 Includes graveled area of pad, transformer, and disturbed area for each tower, excluding access road. The dimensions are based on a circular area of disturbance with a radius of 23 feet (includes a turbine tower with a radius of up to 8 feet and surrounding gravel area with a radius of up to 15 feet). These dimensions represent the maximum potential graveled area for the range of turbine types under consideration.

2 Includes the substation and surrounding gravel within the fenced property. No temporary disturbance will occur outside the fenced area.

3 Includes building and graveled parking and storage areas.

4 Includes met tower measuring approximately 23 feet wide and surrounding graveled area.

5 Assumes poles are spaced an average of 200 feet apart. Disturbance area is also presented in square feet.

6 Assumes worst-case scenario with 27 miles of overhead collectors, which is equal to 30 percent of the total miles of collector cable. Including the worst-case value results in double counting of collector impacts because underground temporary disturbance also assumes the worst-case scenario. These miles are not shown on Figures C-4 and P-11 or included in Table P-11, which is based on the geographic information system (GIS) program.

7 The overhead line will be a maximum of 9 miles in length. The impacts assume poles will be placed as close as 500 feet. Disturbance area is also presented in square feet. These miles are not shown on Figures C-4 and P-11 or included in Table P-11, which is based on the GIS program.

8 The overhead line will be a maximum of 10 miles in length. The impacts assume poles will be placed as close as 500 feet. Disturbance area is also presented in square feet. These miles are not shown on Figures C-4 and P-11 or included in Table P-11, which is based on the GIS program.

9 Assumes maximum of 20 feet of travel lanes or 10 feet of improvements to existing 10-foot road. For roads that are already 20 feet in width, there will be no permanent impacts beyond this width. These roads will only be temporarily widened for construction. Therefore, the length of existing roads needing improvements is greater for temporary impacts than for permanent impacts.

10 Assumes maximum of 30 feet of travel lanes or 14 feet of improvements to existing 16-foot road.

11 Assumes maximum of 20 feet of travel lanes.

12 Assumes 27-foot spur road from the access road to each turbine. The spur road will be 60 feet long when measured from center of tower to center of string road, which is equal to 60 feet - 10 feet (1/2 of access road width) - 23 feet (distance from center of turbine to beginning of road).

TABLE C-3. MONTAGUE DISTURBANCE CALCULATIONS—TEMPORARILY DISTURBED AREAS

Facilities	Notes	Units of Measurement	Montague Dimensions per Unit	Montague Number of Units	Montague Acres	Montague Miles
Substations/O&M Facility(s)						
Collector Substations	1	Acres	0	2	0	
O&M Facility(s)	2	Acres	7	2	14	
Meteorological Towers (self-supporting)	3	Square feet per tower	1600	8	0.29	
Turbine Tower Construction/Staging Areas						
Central staging and storage areas for collector lines and other equipment	4	Acres	5	2	10	
Staging areas (usually 1 per string)	5	Acres	2.5	23	57.5	
Staging area at each tower site	6	Square feet per tower site	158,340	269	977.8	
Central Electrical System						
Underground collector lines						
1 Collector	7	Feet of width per linear foot	24	387,928	213.73	73
2 Collectors	7	Feet of width per linear foot	32	16,879	12.40	3
3 Collectors	7	Feet of width per linear foot	40	0	0.00	0
4 Collectors	7	Feet of width per linear foot	48	0	0.00	0
5 Collectors	7	Feet of width per linear foot	56	0	0.00	0
Temporary access for overhead 34.5-kV Collector Line	8,9	Feet of width per linear foot	12	143,911	39.65	27
Temporary disturbance around overhead 34.5-kV poles	9,10	Square feet per 2-pole location	1576	720	26.05	
230-kV Transmission Line between Montague Collector Substations (230-kV route)						
Temporary Access for Overhead 230-kV Line	11	Feet of width per linear foot	12	43,032	11.85	8
Temporary Disturbance Around Overhead 230-kV Collector Line Structures	12	Square feet per 2-pole location	1560	86	3.08	
"Home Run" from Montague Central Collector Substation to Interconnection (230-kV route)						
Temporary Access for Overhead 230-kV Line	13	Feet of width per linear foot	12	46,526	12.82	9
Temporary Disturbance Around Overhead 230-kV Collector Line Structures	14	Square feet per 2-pole location	1560	93	3.33	
Roads						
Temporarily disturbed area during road construction						
Existing road improvements, except county roads (temporarily widened to 80 feet)	15	Feet of width per linear foot	60	26,974	37.15	5
Existing county road improvements (temporarily widened to 60 feet, within county ROW)	16	Feet of width per linear foot	30	102,130	70.34	19
New 20-foot turbine string roads and road to met tower(s) (temporarily widened to 80 feet)	17	Feet of width per linear foot	60	365,876	503.96	69
New 27-foot turbine spur roads	18	Feet of width per linear foot	60	7,263	10.00	1
Crane Paths	19	Feet of width per linear foot	55	52,682	66.52	10
Total Temporarily Disturbed Area					2070.49 Acres	

Notes: This table is based on the maximum layout facility component locations as shown on Figures C-4 and P-11, and the largest footprint for each facility based on the range of turbine types and support structures under consideration.

1 Assumes contractor will permanently impact entire substation area. Therefore, no temporary impacts will occur.

2 Assumes contractor will temporarily impact area surrounding the permanent footprint of the operations and maintenance building(s) and parking area for equipment staging. Collector cables and other equipment may be stored here as a central staging area.

3 Assumes contractor will temporarily disturb a total of up to 2,500 square feet (sq. ft.) during construction, of which 900 sq. ft. will remain permanently impacted. The 1,600 square feet represents 2,500 sq ft minus 900 sq ft.

4 Central staging and storage area.

5 Staging area at each turbine string.

6 Assumes a worst-case area of disturbance around towers of approximately 160,000 sq. ft. at each of the turbine locations minus the permanent graveled area included in Table C-2. This worst-case disturbance area is larger than the typical staging area and represents the worst-case scenario. The typical disturbance area measures approximately 53,000 square feet around the 1.5-MW turbines (130-foot radius for the 77-meter/253-foot-diameter blades) or approximately 85,000 square feet around the 3.0-MW turbines (164-foot radius for the 100-meter/328-foot-diameter blades), as shown on Figure B-2.

7 Assumes 12 feet on either side of the collector line trench for spoil and travel paths. Trenches are separated by 8 feet for heat dissipation. This distance includes the width of the actual collector line trenches.

8 Temporary disturbance will be an average of 12 feet wide.

9 Assumes worst-case scenario with 27 miles of overhead collectors, which is equal to 30 percent of the total miles of collector cable. Including the worst-case value results in double-counting of collector impacts because underground temporary disturbance also assumes the worst-case scenario. These miles are not shown on Figures C-4 and P-11 or included in Table P-11, which is based on the geographic information system

10 Assumes pole spacing as close as 200 feet, and a temporary disturbance of 40x40 feet at each two-pole location minus the 24-sq.-ft. permanent impact.

11 Temporary disturbance will be an average of 12 feet wide.

12 Assumes pole spacing as close as 500 feet, and a temporary disturbance of 40x40 feet at each two-pole location minus the 40-sq.-ft. permanent

13 Temporary disturbance will be an average of 12 feet wide. This calculation is based on the maximum length of the "home run" (the alternate

14 Assumes pole spacing as close as 500 feet, and a temporary disturbance of 40x40 feet at each two-pole location minus the 40-sq.-ft. permanent impact. This calculation is based on the maximum length of the transmission line (the alternate route).

15 Assumes the 10-foot existing road will be temporarily widened to 80 feet. The temporary disturbance will be equal to 80-foot total width during construction (for crane path plus access road) minus the 20-foot permanent width.

16 Assumes the 16-foot existing road will be temporarily widened to a maximum of 60 feet within the County right-of-way. The County roads will be widened up to 60 feet for portions of the road to allow for wider turning radii and/or straightening of tight corners. The temporary disturbance will be equal to 60-foot total width during construction minus the 30-foot permanent width.

17 The temporary disturbance will be equal to 80-foot total width during construction (for crane path plus access road) minus the 20-foot permanent

18 Assumes 27-foot spur road from the access road to each turbine that would be 60 feet long when measured from center of tower to center of string road, which is equal to 60 feet - 10 feet (1/2 of access road width) - 23 feet (distance from center of turbine to beginning of road).

19 Crane path disturbances for locations where crane paths do not parallel access roads.

Figure C-6

Facility Components

3.0-MW Turbine Layout
(Minimum Turbine Layout)

Montague Wind Power Facility

- Site Boundary
- Micrositing Corridor

Proposed Permanent Facilities

- Proposed Turbine
- Proposed Met Tower
- Proposed New Turbine Road
- Proposed New Met Tower Road
- Proposed Improved Road
- Proposed Underground 34.5-kV Line
- Proposed Overhead 34.5-kV Line
- Proposed 230-kV Transmission Line
- Alternate 1 230-kV Transmission Line
- Alternate 2 230-kV Transmission Line
- Proposed 5-Acre Facility Collector Substation
- Proposed 10-Acre O&M Facility and Staging Area
- Alternate 10-Acre O&M Facility and Staging Area

Proposed Temporary Facilities

- Proposed Crane Path
- Proposed 2.5-Acre Staging Area
- Proposed 5-Acre Staging Area

Existing Facilities

- Existing Transmission Line
- Public Road
- Private Road
- Major Railroad Line
- Streams
- State Boundary
- BPA Slatt Interconnection Substation
- County Boundary

N
W E
S

0 1 2 3 4
Miles

IBERDROLA RENEWABLES

File Path: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\Pre-RAI\Figure C-6 - Facility Components (30-MW Layout).mxd, Date: February 26, 2010 10:33:54 AM

Figure C-7a

Facility Components - Detailed View 1 of 4

3.0-MW Turbine Layout
(Minimum Turbine Layout)

Montague Wind Power Facility

- Site Boundary
- Micrositing Corridor

Proposed Permanent Facilities

- Proposed Turbine
- Proposed Met Tower
- Proposed New Turbine Road
- Proposed New Met Tower Road
- Proposed Improved Road
- Proposed Underground 34.5-kV Line
- Proposed Overhead 34.5-kV Line
- Proposed 230-kV Transmission Line
- Alternate 1 230-kV Transmission Line
- Alternate 2 230-kV Transmission Line
- Proposed 10-Acre O&M Facility and Staging Area
- Alternate 10-Acre O&M Facility and Staging Area

Proposed Temporary Facilities

- Proposed Crane Path
- Proposed 2.5-Acre Staging Area
- Proposed 5-Acre Staging Area

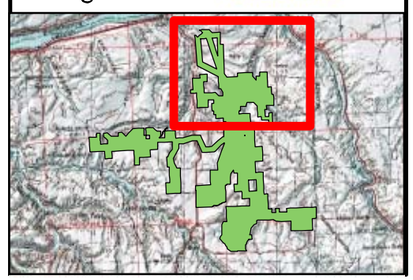
Existing Facilities

- Existing Transmission Line
- Public, Paved
- Public, Gravel
- Other Public Road
- Private, Gravel
- Other Private Road
- Major Railroad Line
- Streams
- BPA Slatt Interconnection Substation
- County Boundary

0 0.5 1 1.5
Miles

N
W E
S

IBERDROLA RENEWABLES



File Path: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\Pre-RAI\Figure C-7a - Facility Components - Detailed View (30-MW Layout).mxd, Date: February 26, 2010 10:30:52 AM

Figure C-7b

Facility Components - Detailed View 2 of 4

3.0-MW Turbine Layout
(Minimum Turbine Layout)

Montague Wind Power Facility

- Site Boundary
- Micrositing Corridor

Proposed Permanent Facilities

- Proposed Turbine
- Proposed Met Tower
- Proposed New Turbine Road
- Proposed New Met Tower Road
- Proposed Improved Road
- Proposed Underground 34.5-kV Line
- Proposed Overhead 34.5-kV Line
- Proposed 230-kV Transmission Line
- Proposed 5-Acre Facility Corridor Substation

Proposed Temporary Facilities

- Proposed Crane Path
- Proposed 2.5-Acre Staging Area
- Proposed 5-Acre Staging Area

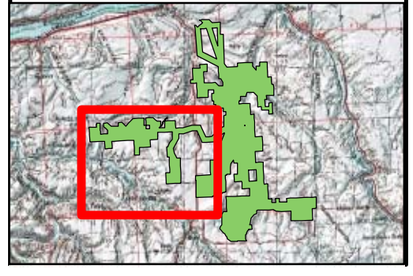
Existing Facilities

- Existing Transmission Line
- Public, Paved
- Public, Gravel
- Other Public Road
- Private, Gravel
- Other Private Road
- Major Railroad Line
- Streams
- County Boundary

0 0.5 1 1.5
Miles

N
W E
S

IBERDROLA RENEWABLES



File Path: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\Pre-RAI\Figure C-7b - Facility Components - Detailed View (30-MW Layout).mxd, Date: February 26, 2010 10:38:24 AM

Figure C-7c

Facility Components - Detailed View 3 of 4

3.0-MW Turbine Layout
(Minimum Turbine Layout)

Montague Wind Power Facility

- Site Boundary
- Micrositing Corridor

Proposed Permanent Facilities

- Proposed Turbine
- Proposed Met Tower
- Proposed New Turbine Road
- Proposed New Met Tower Road
- Proposed Improved Road
- Proposed Underground 34.5-kV Line
- Proposed Overhead 34.5-kV Line
- Proposed 230-kV Transmission Line
- Proposed 5-Acre Facility Corridor Substation

Proposed Temporary Facilities

- Proposed Crane Path
- Proposed 2.5-Acre Staging Area
- Proposed 5-Acre Staging Area

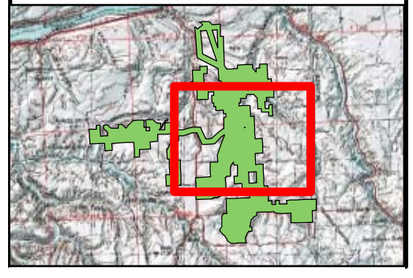
Existing Facilities

- Existing Transmission Line
- Public, Paved
- Public, Gravel
- Other Public Road
- Private, Gravel
- Other Private Road
- Major Railroad Line
- Streams
- County Boundary

0 0.5 1 1.5
Miles

N W E S

IBERDROLA RENEWABLES



File Path: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\Pre-RAI\Figure C-7c - Facility Components - Detailed View (30-MW Layout).mxd, Date: February 26, 2010 10:39:57 AM

Figure C-7d

Facility Components - Detailed View 4 of 4

3.0-MW Turbine Layout
(Minimum Turbine Layout)

Montague Wind Power Facility

- Site Boundary
- Micrositing Corridor

Proposed Permanent Facilities

- Proposed Turbine
- Proposed Met Tower
- Proposed New Turbine Road
- Proposed New Met Tower Road
- Proposed Improved Road
- Proposed Underground 34.5-kV Line
- Proposed Overhead 34.5-kV Line

Proposed Temporary Facilities

- Proposed Crane Path
- Proposed 2.5-Acre Staging Area

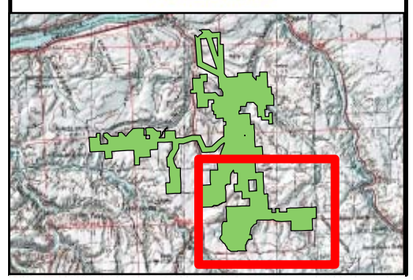
Existing Facilities

- Existing Transmission Line
- Public, Paved
- Public, Gravel
- Other Public Road
- Private, Gravel
- Other Private Road
- Major Railroad Line
- Streams
- County Boundary

N
W E
S

0 0.5 1 1.5
Miles

IBERDROLA RENEWABLES



File Path: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\Pre-RAI\Figure C-7d - Facility Components - Detailed View (30-MW Layout).mxd, Date: February 26, 2010 10:41:31 AM

ATTACHMENT F-1

Morrow County Landowners within 500 feet of Proposed Site Boundary

ATTACHMENT F-1
Morrow County Landowners within 500 feet of Proposed Site Boundary

TAXLOTID	OWNER	Name_Address	Address
01N23-06300	MACWHEAT, INC	69849 PROUDFOOT RD	IONE, OR 97843
01S23-00900	MACWHEAT, INC	69849 PROUDFOOT RD	IONE, OR 97843

ATTACHMENT K-1

Land Use

Comment Letters from Gilliam County Planning Department
Revised Table K-1, High-Value Farmland Impacts
Figure K-6a, Land Capability Classification, Detailed View

Please complete this form and send to the Oregon Department of Energy by February 26, 2010.

Use additional pages as necessary.

Response Form: Montague Wind Power Facility

To: John G. White, Oregon Department of Energy Date: 02/12/2010

From: Susie Anderson (Your name) E-mail: susie.anderson@co.gilliam.or.us

Agency: Gilliam County Phone: 541 384 2381

("Agency" means a state or local agency, local government or tribe.)

This agency has the following comments about the completeness of the Site Certificate application for the proposed **Montague Wind Power Facility**:

1. This agency administers the following applicable statutes, administrative rules or ordinances:

See Attached Letter

2. This agency needs the following additional information to review the application for compliance with those statutes, rules or ordinances:

3. The applicant will need the following permit(s) from this agency:

4. This agency needs the following additional information to determine whether the permit(s) should be issued (explain the current status of permit applications, if any have been received):

Gilliam County Planning Department
P.O. Box 427
Condon, OR 97823

Phone (541) 384-2381
(800) 982-1172
Fax (541) 384-2166
e-mail susie.anderson@co.gilliam.or.us

February 26, 2010

John White
Oregon Department of Energy
625 Marion Street NE
Salem, OR 97301-3737

RE: Gilliam County (Reviewing Agency) comments regarding the Montague Wind Power Facility

Dear Mr. White;

This letter is in response to the e-mail that you sent to this office on February 18, 2010 and to the Response Form: Montague Wind Power Facility.

The Gilliam County Zoning Ordinance (GCZO) Sections 7.101 and 7.020(T) were in effect as of the date of submission of January 10, 2010 for the Montague Wind Power Facility.

In addition, we are requesting that the criteria you requested clarification on be addressed. These GCZO Sections 4.020(A) (high value farmland), 4.020(D)(14)(due to new statute, probably not applicable), 4.020(J)(setbacks) and 7.020(Q) (Conditional Uses in Exclusive Farm Use Zones) should be individually addressed by the applicant.

It is my understanding that the GCZO Sections 7.010 and 7.020(T) will also be addressed.

As a member of the special advisory group, we respectfully request that you consider and incorporate these criteria in your land use findings as you process the site certification for the proposed Montague Wind Power Wind Facility.

As the Gilliam County Planning Commission will not be considering this proposal it is imperative that you incorporate the above referenced material into your process for the site certification for the proposed Montague Wind Power Facility. This will ensure that Gilliam County has input into this process and that our local land use criteria is recognized and applied.

Please feel free to contact me, or our land use consultant Brent Lake, if you require further assistance.

Sincerely,

Susie Anderson

Susie Anderson
Gilliam County Planning Director

Cc Gilliam County Court
Brent Lake – Central Oregon Land Use Consultants

Gilliam County
Planning Department

221 S. Oregon Street
PO Box 427
Condon, OR 97823

March 8, 2010

John White
Oregon Department of Energy
625 Marion Street NE
Salem, OR 97301-3737

RE: Gilliam County (Reviewing Agency) comments regarding the Montague Wind Power Facility

Dear Mr. White;

This letter is in response to the e-mail that you sent to this office on February 18, 2010 and to the Response Form: Montague Wind Power Facility.

In answer to your question of if the Gilliam County Zoning Ordinance (GCZO) Sections 7.010 and 7.020(T) were in effect as of the date of submission of January 10, 2010 for the Montague Wind Power Facility;

We are recommending that the proposed order include the following criteria from the Gilliam County Ordinance:

- Article 4; Section 4.020(D)(29)-Utility facilities necessary for public service
- Article 4; Section 4.020(J) - Property Development Standards. This would apply to the O&M structures only.
- Article 4; Section 4.020(D)(34)-Wind Power Generation Facilities
- Article 4; Section 4.020(D)(14), Commercial utility facilities for the purpose of generating power for public use by sale
- Article 4; Section 4-020(H)-Specific Review Criteria
  - Section 4.040(H) is referenced in all staff reports prepared for conditional uses and is addressed in all of the conditional use permits. It is not necessary to address Section 7.020(Q) as they are substantively the same.
- Article 7; Section 7.020(T) - Standards Governing Conditional Uses; Wind Power Generation Facility Siting Requirements

As for the requirement for 4.020(A) –high value farmland, you are correct in that it is not applicable. However, it wouid be the responsibility of the project developer to identify any high value farmland to determine which new OAR process they will to go through.

Article 7; Section 7.020(A) is not necessary to address separately as the setback for wind energy facilities is addressed in 7.020(T) and Section 7.020(S) the transportation related criteria is not applicable as the developer is required to consult with the Gilliam County Roadmaster for road use agreements and right of way permit prior to construction. In addition, 4.020(D)(25), Transportation improvements on rural lands would also not be applicable for the same reasons.

As a member of the special advisory group, we respectfully request that you consider and incorporate these criteria

Planning Director
Susie Anderson
Phone:
541.384.2381
Fax: 541.384.2166

susie.anderson@co.gilliam.or.us

Gilliam County
Planning Department

221 S. Oregon Street
PO Box 427
Condon, OR 97823

in your land use findings as you process the site certification for the proposed Montague Wind Power Wind Facility.
As the Gilliam County Planning Commission will not be considering this proposal it is imperative that you incorporate the above referenced material into your process for the propose order for the Montague Wind Power Facility. This will ensure that Gilliam County has input into this process and that our local land use criteria is recognized and applied.

Please feel free to contact me, or our land use consultant Brent Lake, if you require further assistance.

Sincerely,

Susie Anderson

Susie Anderson
Gilliam County Planning Director

Cc Gilliam County Court
Brent Lake – Central Oregon Land Use Consultants

Planning Director
Susie Anderson
Phone:
541.384.2381
Fax: 541.384.2166

susie.anderson@co.gilliam.or.us

Revised Table K-1

Areas Occupied by the Power Generation Facility

Structure	Total Permanent Impacts (acres)	High-Value Farmland Impacts (acres)[1]	Non-High-Value Farmland Impacts (acres)[2]
Principal Use			
Turbine towers, including pad areas	10.251	0.000	10.251
Meteorological towers	0.165	0.000	0.165
Overhead 34.5-kV Collector Line Structures	0.195	0.003	0.192
Overhead 230-kV Transmission Line Structures	0.164	0.000	0.164
Montague Collector Substations	10.000	0.000	10.000
O&M Facilities	6.000	0.000	6.000
Subtotal	26.775	*0.003*	*26.773*
Access Roads	194.573	2.348	192.225
Total	**221.348**	**2.351**	**218.998**

Notes: This table is based on the worst-case locations for Facility components as shown on Figures C-9 and P-9 in Exhibits C and P, respectively, and as described in Exhibit C, Section C.3.4.

[1]OAR 660-033-0020(8)(a) defines high value farmland as a tract composed predominately of soils that are irrigated or not irrigated and classified prime, unique, Class I or II by the NRCS and also include other specific soils listed in the OARs. Thus, impacts to Class I and II soils are high-value farmland impacts.

[2]OAR 660-033-00020(1)(a)(A) defines agricultural land as NRCS Soil Classes I-VI in Eastern Oregon and OAR 660-033-00020(8)(a) defines high-value as NRCS Soil Classes I and II. Thus, non-high-value farmland consists of those areas in NRCS Soil Classes III-VI, and for purposes of this analysis, also includes VII soils.

Figure K-6a

Land Capability Classification - Detailed View

1.5-MW Turbine Layout
(Maximum Turbine Layout)

Montague Wind Power Facility

- Site Boundary/Micrositing Corridor
- 785ft Buffer of Washington Ground Squirrel Burrows

Proposed Permanent Facilities

- Proposed Turbine
- Proposed Met Tower
- Proposed New Turbine Road
- Proposed New Met Tower Road
- Proposed Improved Road
- Proposed Underground 34.5-kV Line
- Proposed Overhead 34.5-kV Line
- Proposed 230-kV Transmission Line
- Alternate 1 230-kV Transmission Line
- Alternate 2 230-kV Transmission Line
- Proposed 5-Acre Facility Collector Substation
- Proposed 10-Acre O&M Facility and Staging Area
- Alternate 10-Acre O&M Facility and Staging Area

Proposed Temporary Facilities

- Proposed Crane Path
- Proposed 2.5-Acre Staging Area
- Proposed 5-Acre Staging Area

Existing Facilities

- Existing Transmission Line
- Public Road
- Private Road
- Major Railroad Line
- Streams
- State Boundary
- BPA Slatt Interconnection Substation
- County Boundary

Land Capability Classification

- Class I
- Class II
- Class III
- Class IV
- Class V
- Class VI
- Class VII
- Class VIII
- No Data

Note: All soil types assume a land capability class for nonirrigated, except in the areas defined with a habitat type of "Developed-Irrigated Agriculture (DI)" on figure P-7.

N
W E
S

0 500 1,000 1,500 2,000
Feet

Source:
U.S. Department of Agriculture, Natural Resources Conservation Service Soil Survey Geographic (SSURGO) for Umatilla County, Oregon (2009)

IBERDROLA RENEWABLES

File Name: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\RAI\Figure K-6a - Land Capability Classification - Detailed View.mxd

Modified Date: 4/21/2010

ATTACHMENT M-1

Financial Assurance Letter

"la Caixa"

April 24, 2010

Oregon Energy Facility Sitting Council
Oregon Department of Energy
Salem, OR

Ladies and Gentlemen:

Iberdrola Renewables, Inc. is an affiliate of Iberdrola SA. Iberdrola SA and its affiliates/subsidiaries are valued clients of Caja de Ahorros y Pensiones de Barcelona ("la Caixa').

It is our understanding that la Caixa may be asked to provide a letter of credit on behalf of Iberdrola Renewables, Inc., for the project known as the Montague Wind Power Facility. It is also our understanding this potential letter of credit could be required in the amount of twenty-one million, two hundred nineteen thousand ($21,219,000) dollars.

Iberdrola Renewables, Inc. has sufficient available letter of credit capacity to support this request under its existing uncommitted financing arrangements with la Caixa. This letter does not constitute a commitment and is subject to our review and acceptance of the terms and conditions of the final contract and required letter of credit form or forms.

You understand, of course, that any arrangement for the final letter of credit or letters of credit is a matter between Iberdrola Renewables, Inc. and la Caixa and we assume no liability to third parties or to you, if for any reason, we do not execute said letter or letters of credit.

Sincerely,

Jose Carlos Hernández Bertomeu

Ana María Pérez Fernández

ATTACHMENT O-1

City of Arlington Water Right Confirmation

CITY OF ARLINGTON

P.O. BOX 68
ARLINGTON, OR 97812
PHONE: 541-454-2743
FAX: 541-454-2753
TTY: 800-572-0638

January 11, 2010

Sara Parsons

1125 NW Couch St. Ste. 700

Portland, OR 97209

Dear Sara,

This letter is to confirm our discussion that the City of Arlington can supply Iberdrola Renewables with approximately forty million gallons of water for construction of the Montague Wind Facility. We look forward to working with Iberdrola to complete the construction of this project. Should you have any questions please call me at 541-454-2740. Thank you.

Sincerely,
Tim Wetherell,

Public Works Superintendent

City of Arlington

ATTACHMENT P-1

Onsite Habitat Survey Schedule

TABLE 1
Montague Schedule of Onsite Surveys to be Completed

Item Number	Page Reference in Application for Site Certificate	Survey	Proposed Start	Proposed Finish	Explanatory Text in Application for Site Certificate
1	P-13 (also P-33, P-81, and Q-7) and Attachment Q-1. [RAI P1]	Focused botanical surveys	May 2010	July 2010	Biologists will conduct focused botanical surveys during the appropriate bloom period in 2010 to identify additional state or federally listed or non-listed, special-status plant populations located near proposed Facility components. Preliminary survey corridors for the planned botanical surveys are shown in Figure P-2. CH2M HILL will provide a written report of the field investigation to ODFW to detail any identified state and federal listed or candidate plant species.
2	P-84, Q-13. [RAI P6]	WGS surveys (two surveys)	First survey began 3/2/10. Second survey planned to start 4/15/10	Second survey scheduled to be completed by June 5.	WGS colonies will be surveyed prior to construction and the applicable boundaries flagged for avoidance.
3	Attachment P-7, p. 13, Q-13 and Q-17. [RAI P6]	Revisits to previously identified WGS holes as well as surveys of previously unsurveyed corridors for WGS	See above	See above	Locations where WGS sign of use (holes, pellets, vocalizations) were recorded in 2008 and 2009 within 2010 survey corridors will be revisited once in 2010 to confirm activity status. The 2008 surveyed areas (one of two surveys completed) will be surveyed the second time in 2010. Unsurveyed Facility corridors will also be surveyed; two surveys will be conducted. Results of the 2008, 2009 and planned 2010 wildlife surveys will be reported following the 2010 surveys. (Page Q-13)
4	P-15 (also P-79 and Q-8) [RAIs P2 and P5]	Special status wildlife surveys (ground based transects)	Planned to start 4/15/10 concurrently with second WGS survey	Scheduled to be completed by June 5	Special-status wildlife surveys are planned for spring 2010 in all corridors not evaluated thoroughly for all the target species. The spring 2010 surveys will follow the methods described above. Results of the 2008, 2009, and planned spring 2010 wildlife surveys will be reported following the 2010 surveys. (Page P-15) These surveys will be conducted prior to construction, and the Applicant has committed to designing the permanent Facility components and temporary disturbance areas to avoid any threatened, endangered, or candidate species

TABLE 1
Montague Schedule of Onsite Surveys to be Completed

Item Number	Page Reference in Application for Site Certificate	Survey	Proposed Start	Proposed Finish	Explanatory Text in Application for Site Certificate
					found during these clearance surveys. (Page Q-8)
5	P-16 , P-66, and Attachment P-7) [RAI P3]	Raptor nest surveys	Early to mid-May, 2010	June 2010	While a large portion (more than one-third) of the overall Facility raptor nest survey radius was surveyed in 2009 for various facilities, surveys of the remaining area within the Facility 2-mile raptor survey radius are planned for 2010. Where portions of the Facility 2-mile raptor survey radius overlap with operating wind facilities, raptor nest surveys will avoid operating turbines. The Applicant will also coordinate with other developers conducting raptor nest surveys in 2010 to reduce duplication; for example, a large portion of remaining area within the Facility 2-mile raptor survey radius overlaps with the 2-mile raptor survey radius for the Shepherds Flat Wind Farm (Shepherds Flat) and the Saddle Butte Wind Park (both in Oregon). Also in 2010, Swainson's and ferruginous hawk nests identified in 2009 in areas already surveyed that are within the Facility 2-mile survey radius will be checked for status, as requested by ODFW. (Page P-16) The 2010 aerial raptor nest survey is planned to occur during the period May-June 2010. Details about survey methods are in Attachment P-7. In addition to the aerial raptor nest survey, during the 2010 spring season ground-based walking transects for special-status vertebrate wildlife species, suitable trees, and other potential raptor nest structures such as basalt cliffs and escarpments will be examined for use by nesting raptors.
6	Attachment P-7, pages 8-9, and Exhibit P, Table P-7 on page P-44	Avian Use Surveys	One full year already completed at five plots Supplemental avian use surveys are being conducted at six additional plots.	One full year already completed at five plots Supplemental avian use surveys could continue through	<u>2008–2009 Leaning Juniper IIB Avian Use Surveys</u> • Point count surveys of seven plots D, E, F, G, H, I, and L (Figure 3) • One full year of surveys: September 4, 2008–August 7, 2009; season survey dates are the same as for five Montague plots • Several LJIIB plots occur partially within the

TABLE 1
Montague Schedule of Onsite Surveys to be Completed

Item Number	Page Reference in Application for Site Certificate	Survey	Proposed Start	Proposed Finish	Explanatory Text in Application for Site Certificate
	[RAI P4]		Began September 2009	early to mid-August	Montague site boundary (Figure 3) <u>Fall 2008 – Summer 2009 Montague Avian Use Surveys</u> • Point count surveys of five plots: A, B, C, J, and K (Figure 3) • One full year of surveys: September 4, 2008, through August 7, 2009 <u>2009 Fall Season Montague Avian Use Surveys</u> • Point count surveys of six plots: AA, BB, EE, FF, GG, HH (Figure 3) • Fall surveys began on September 10, 2009, and could continue for one full year.

ATTACHMENT P-2

Revised Tables P-10 and P-11
Habitat Impact Calculations

Table P-10. Habitat Types and Categories within the Facility Site Boundary with Area of Impact--Current Layout

Category and Habitat Description	Habitat Subtype Code	Impacts (Current)		
		Total Acres Within Site Boundary	**Temporary[a] Facilities** (acres disturbed)	**Permanent[b] Facilities** (acres disturbed)
Category 1				
Developed – CRP or Other Planted Grassland	DC	88.27	0.00	0.00
Grassland – Exotic Annual	GA	59.29	0.00	0.00
Grassland – Native Perennial	GB	54.93	0.00	0.00
Shrub-steppe – Sagebrush (Big Sage)	SSA	107.51	0.00	0.00
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	199.09	0.00	0.00
Subtotal		**509.09**	**0.00**	**0.00**
Category 2				
Exposed Rock on Slopes – Escarpment	ESC	28.67	0.34	0.09
Grassland – Exotic Annual	GA	571.56	68.81	7.53
Grassland – Native Perennial	GB	429.10	21.66	2.25
Shrub-steppe – Sagebrush (Big Sage)	SSA	2,318.22	72.90	12.68
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	884.69	70.79	10.94
Woodland- – Juniper	WJ	244.53	5.58	0.97
Woodland–Riparian	WR	2.49	0.00	0.00
Subtotal		**4,479.26**	**240.08**	**34.47**
Category 3				
Developed – CRP or Other Planted Grassland	DC	1,423.92	78.47	7.51
Grassland – Exotic Annual	GA	1,528.83	138.67	20.24
Grassland – Native Perennial	GB	3,137.61	88.71	12.23
Shrub-steppe – Sagebrush (Big Sage)	SSA	344.16	3.14	3.65
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	7,316.80	327.94	40.50
Woodland- – Juniper	WJ	41.11	0.30	0.00
Subtotal		**13,792.43**	**637.23**	**84.12**
Category 4				
Developed – Old Field	DB	7.54	0.00	0.00
Grassland – Exotic Annual	GA	1,046.22	44.79	5.41
Grassland – Native Perennial	GB	193.24	4.82	0.48
Shrub-steppe – Sagebrush (Big Sage)	SSA	21.90	0.04	< 0.01
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	174.77	10.46	1.64
Subtotal		**1,443.66**	**60.10**	**7.53**
Category 5				
none				
Category 6				
Developed – Irrigated Agriculture	DI	270.76	6.32	2.77
Developed – Dryland Wheat	DW	12,660.54	759.59	81.76
Developed – Other	DX	246.57	13.35	9.48
Subtotal		**13,177.88**	**779.27**	**94.01**
Total for all Categories		**33,402.32**	**1,716.68**	**220.12**

[a] Table C-3 lists temporary facilities and their impacts.

[b] Table C-2 lists permanent facilities and their impacts.

CRP = Conservation Reserve Program

Note: Because some Facility impact areas overlap, the total Facility disturbance to habitat is less than the sum of all Facility impact areas, as represented in Tables C-2 and C-3. The total areas in Tables C-2 and C-3 are not exact estimates of the Facility's total impact to land and habitat, as they do not account for overlapping impact areas. Consequently, they show a larger overall impact than will occur. When calculating the impacts in the Exhibit P tables (Tables P 10 and P 11) using geographic information systems (GIS), overlapping impact areas were not double-counted. As a result, the tables in Exhibit P provide a more accurate total calculation of impact to habitat.

Table P-11. Habitat Types and Categories within the Facility Site Boundary with Maximum Possible Area of Impact—Worst-Case Layout.

Category and Habitat Description	Habitat Subtype	Impacts (Worst Case)		
		Total Acres Within Facility Site Boundary	Temporary Facilities[a] (acres disturbed)	Permanent Facilities[b] (acres disturbed)
Category 1				
Developed – CRP or Other Planted Grassland	DC	88.27	0.00	0.00
Grassland – Exotic Annual	GA	59.29	0.00	0.00
Grassland – Native Perennial	GB	54.93	0.00	0.00
Shrub-steppe – Sagebrush (Big Sage)	SSA	107.51	0.00	0.00
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	199.09	0.00	0.00
Subtotal		**509.09**	**0.00**	**0.00**
Category 2				
Exposed Rock on Slopes – Escarpment	ESC	28.67	0.34	0.09
Grassland – Exotic Annual	GA	571.56	81.26	13.36
Grassland – Native Perennial	GB	429.10	21.66	2.25
Shrub-steppe – Sagebrush (Big Sage)	SSA	2,318.22	96.30	14.90
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	884.69	70.80	10.93
Woodland- – Juniper	WJ	244.53	16.33	1.99
Woodland–Riparian	WR	2.49	0.00	0.00
Subtotal		**4,479.26**	**286.69**	**43.53**
Category 3				
Developed – CRP or Other Planted Grassland	DC	1,423.92	76.85	7.45
Grassland – Exotic Annual	GA	1,528.83	132.82	14.75
Grassland – Native Perennial	GB	3,137.61	91.10	12.35
Shrub-steppe – Sagebrush (Big Sage)	SSA	344.16	3.32	3.65
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	7,316.80	312.83	37.83
Woodland- – Juniper	WJ	41.11	0.30	0.00
Subtotal		**13,792.43**	**617.22**	**76.03**
Category 4				
Developed – Old Field	DB	7.54	0.00	0.00
Grassland – Exotic Annual	GA	1,046.22	34.83	5.21
Grassland – Native Perennial	GB	193.24	2.28	0.59
Shrub-steppe – Sagebrush (Big Sage)	SSA	21.90	0.04	< 0.1
Shrub-steppe – Rabbitbrush/Snakeweed	SSB	174.77	12.96	1.64
Subtotal		**1,443.66**	**50.12**	**7.44**
Category 5				
none				
Category 6				
Developed – Irrigated Agriculture	DI	270.76	6.32	2.77
Developed – Dryland Wheat	DW	12,660.54	742.82	80.79
Developed – Other	DX	246.57	13.35	9.48
Subtotal		**13,177.88**	**762.49**	**93.04**
Total for all Categories		**33,402.32**	**1,716.51**	**220.04**

[a] Table C-3 lists temporary facilities and their impacts.

[b] Table C-2 lists permanent facilities and their impacts.

CRP = Conservation Reserve Program

Note: Because some Facility impact areas overlap, the total Facility disturbance to habitat is less than the sum of all Facility impact areas, as represented in Tables C-2 and C-3. The total areas in Tables C-2 and C-3 are not exact estimates of the Facility's total impact to land and habitat, as they do not account for overlapping impact areas. Consequently, they show a larger overall impact than will occur. When calculating the impacts in the Exhibit P tables (Tables P 9 and P 10) using geographic information systems (GIS), overlapping impact areas were not double-counted. As a result, the tables in Exhibit P provide a more accurate total calculation of impact to habitat.

ATTACHMENT P-3

Revised Figure Q-2c Washington Ground Squirrel Locations and Habitat Types: Detailed View

CONFIDENTIAL AND PROVIDED UNDER SEPARATE COVER

ATTACHMENT P-4

Revised Table Q-2
Washington Ground Squirrel Detections

Table Q-2. Washington Ground Squirrel Detections within the Montague Site Boundary

WGS Site #	Soils	Mapped Habitat Type (2009)	Estimated Size	General Notes	General Location
1	4C	SSA	Very small	Holes plus droppings	Western portion of Facility
2	4C	SSA	Very small	3 holes, fresh pellet	Western portion of Facility
3	4C	SSA	Small	7-8 holes	Western portion of Facility
4	23B	SSB	Small	Approx. 10 holes	Western portion of Facility
5	23C	SSB	Very small	1 fresh hole, 1 fresh pellet	Western portion of Facility
6	56B	GA	Small	10+ holes, vocalization	Western portion of Facility
7	23B	SSB	Very small	3 holes, 1 dropping	Northeastern portion of Facility
8	55B	SSB	Very small	1 dropping, 1 hole	Northeastern portion of Facility
9	55D	SSB	Small	Numerous holes, dropping	Northeastern portion of Facility
10	40D	SSB	Very small	WGS seen + lots of holes	Northeastern portion of Facility
11	40D	SSB	Very small	WGS seen, old dropping	Northeastern portion of Facility
12	55C,55E	SSA, GB	Unknown	WGS seen from Tree Lane in 2006 and 2007	Central portion of Facility
13	55B	SSB	Very small	1 hole with WGS dropping found incidentally while onsite	Northeastern portion of Facility
25	56B, 56C	SSB	Very Small, < 1 ac	Single hole	Southwest of proposed new turbine road and proposed 2.5-acre staging area. Near Southwest corner of amended LJIIB site boundary.

Source: Kronner, 2009 (Attachment P-7)

Estimated Size (based on one survey in March (Sites 1-11) and incidental observations obtained from other sources (Sites 12 and 13).

Very Small = < 10 individuals, usually single to several holes, may be one or a few individuals. Small = 10 to 30 individuals.

Medium = 30 to 40 individuals. Large = 40 to 100+ individuals.

Soils

4C – Blalock loam
23B, 23C – Olex silt loam
40D – Sagehill fine sandy loam
55B, 55C, 55D, 55E – Warden silt loam
56B – Willis silt loam

Mapped Habitat Types

SSA – Shrub-steppe, Sagebrush
SSB – Shrub-steppe, Rabbitbrush/Snakeweed
GA – Grassland, Exotic Annual Grass
GB – Grassland, Native Perennial

ATTACHMENT P-5

Avian, Bat, and Habitat Report (WEST, Inc., February 2010)

AVIAN, BAT AND HABITAT CUMULATIVE IMPACTS ASSOCIATED WITH WIND ENERGY DEVELOPMENT IN THE COLUMBIA PLATEAU ECOREGION OF EASTERN WASHINGTON AND OREGON

Prepared For:

Klickitat County Planning Department

Prepared By:

Gregory D. Johnson and Wallace P. Erickson

Western EcoSystems Technology, Inc.
2003 Central Avenue
Cheyenne, Wyoming 82001

February 2010

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION AND BACKGROUND

Over the last decade, wind energy development has been occurring in Oregon and Washington within the Columbia Plateau physiographic region (ecoregion). With this development comes the potential for direct impacts to birds and bats through collision mortality and for indirect effects through habitat fragmentation or displacement of birds and other wildlife. Proposals for wind energy developments are commonly reviewed by natural resource agencies, private conservation groups, permitting authorities and other stakeholders. Frequently, baseline studies are conducted to estimate bird and bat abundance at proposed development sites for use in impact assessments and siting project features, followed by post-construction monitoring studies to measure actual impacts from the wind-energy facility.

With the possible exception of golden eagles (*Aquila chrysaetos*) at the Altamont Pass wind-energy facility, California, where an estimated 40–70 golden eagles are killed each year (Hunt 2002, Smallwood and Thelander 2004), no wind-energy facilities have been documented to cause population declines of any species (Johnson and Stephens 2010). The purpose of this report is to estimate cumulative impacts associated with all existing, permitted, and currently proposed wind-energy facilities within the Columbia Plateau Ecoregion (CPE) of eastern Washington and Oregon. This report updates a previous version (Johnson and Erickson 2008) to account for additional bird and bat fatality estimates from the Leaning Juniper and Klondike III wind energy projects in Oregon, as well as additional raw data on species composition of turbine fatalities from the Goodnoe and White Creek wind energy facilities in Klickitat County, Washington and the Pebble and Hay Canyon wind energy facilities in Oregon. For the purpose of this analysis, we assumed that for cumulative impacts to occur, there must be a potential for a long-term reduction in the size of a population of birds or bats. When assessing the potential for cumulative impacts, it is necessary to first define the population potentially affected by wind energy development. Because birds and other animals do not recognize geopolitical boundaries, we have defined the affected population as those birds and bats of each species that breed, winter, or migrate through the CPE.

ANALYSIS AREA AND WIND ENERGY PROJECTS

As of September 2009, there were 4159 MW of wind energy either built or under construction in Washington and Oregon (AWEA 2009), most of which has been within the Columbia Plateau Level III Ecoregion (Thorson et al. 2003; Figure 1). In the earlier version of this cumulative effects analysis (Johnson and Erickson 2008), we attempted to contact every county within the CPE in an effort to estimate future wind energy development based on existing permit applications, which resulted in an estimate of 6700 MW of wind energy development in the CPE. However, past experience indicates that not all of the projects that are proposed will ultimately be issued permits for the size originally proposed and not all permitted projects are built, or fully built-out. Consequently, this method can result in significantly over-estimating future wind energy development. However, for consistency, for the purpose of this analysis, we assumed that 6700 MW of wind power would be present in the CPE. We also calculated the numbers of

fatalities that reflect Northwest Power and Conservation Council (NPCC) estimates, which recognize constraints on wind development, such as transmission capacity. NPCC projects that 5,577 MW of wind energy development will be installed by the year 2013 (Jeff King, Senior Resource Analyst, presentation to the Northwest Wind Integration Forum Steering Committee, January 7, 2010).

The Columbia Plateau was historically characterized by open, arid shrub-steppe and grassland-steppe habitats. The current predominant land use of the Ecoregion is dryland agriculture, land enrolled in the Conservation Reserve Program (CRP), and rangeland (Figure 2). Precipitation through the region is 6 to 12 inches (about 15-30 centimeters) per year (Thorson et al. 2003). Surrounding ecoregions are more mountainous, receive more precipitation, and are more forested than the Columbia Plateau.

METHODS

This report provides a broad, qualitative analysis using existing public information about existing and proposed wind-energy facilities in the region, estimated population sizes of birds in the CPE, results of fatality monitoring studies, and published literature to compile a cumulative impact analysis for bird and bat resources. The general approach to the cumulative effects analysis was to summarize results of fatality monitoring studies at operational wind-energy facilities within the CPE, and use those results to estimate impacts for all constructed and proposed wind-energy facilities within the same ecoregion. Habitat and land use throughout the entire CPE are similar.

This cumulative effects analysis relies heavily on data from 12 wind-energy facilities in the CPE where at least one full year of monitoring for fatalities has occurred. Most of the operating facilities have had or will have some sort of bird or casualty monitoring associated with them, and post-construction fatality monitoring data are available from 12 operational wind energy facilities in the CPE (Table 1). For each of the individual study areas from which fatality results are available, the predominant land use was a mosaic of agriculture, mainly dryland wheat farming, and grassland or shrub- steppe rangeland used for livestock grazing. In general, the region where future wind-energy facilities are being planned is similar in vegetation types (Quigley and Arbelbeide 1997), although, for any given facility, the amount of each type varies. It is assumed for the analysis that results from the existing studies would be applicable to new proposed facilities.

With the exception of the Condon, Oregon, wind-energy facility, where no scavenging or searcher efficiency trials were conducted to estimate total mortality, the 11 data sets used in this report were collected using similar methods, where observed fatality rates, calculated from standardized carcass searches, were adjusted for searcher efficiency and carcass removal biases. The analysis operates under the assumption that the bird and bat communities are similar across all wind-energy facilities because of habitat and land use similarities throughout the ecoregion, and thus are applicable to proposed facilities in this same ecoregion. Details about results, methods, and estimates of potential bird and bat impacts from each individual wind-energy facility are available in the referenced facility reports.

To define population sizes of those species most likely to be affected by wind energy development in the CPE, we used data from a recent publication that estimates breeding size of bird species by Bird Conservation Region, and then by that portion of each state within the Bird Conservation Region (see Blancher et al. 2007). Those portions of Washington and Oregon within the Great Basin Bird Conservation Region (see US NABCI Committee (2000) for a description) essentially comprise the same area that we have defined as the CPE. To our knowledge these are the only population estimates available for the entire CPE.

Raptors

Raptor use estimates and post-construction raptor fatality estimates are available for 12 facilities in eastern Washington and Oregon. Based on available data, it is likely that raptor mortality throughout the CPE would be on the same order of magnitude as other wind-energy facilities in the western US outside California, where it ranges from none to 0.15/MW/year (Johnson and Stephens 2010). Raptor use (raptors/survey) at wind resource areas (WRAs) in the CPE ranges from 0.26 to 1.64, and averages 0.68 observations per 20-min survey (Table 2). This use is substantially lower than that at Altamont Pass and High Winds, two facilities in California that have had relatively high levels of raptor mortality. Similar levels of raptor mortality in the CPE would not be expected. To predict raptor mortality for all existing and proposed wind-energy facilities in the CPE, we assumed it would be similar to the other existing wind-energy facilities in the CPE. Mean annual raptor mortality (fatalities/MW/year) at the 12 existing wind-energy facilities in eastern Washington and Oregon ranges from 0 to 0.21/MW/year, with a mean of 0.077/MW/year. Because the 1.5–3.0 MW turbines constructed or proposed for most new-generation wind-energy facilities are larger than turbines used at most of the existing wind-energy facilities, it is likely not appropriate to predict raptor mortality in the CPE using per turbine estimates from the other wind-energy facilities, as several of the existing facilities used smaller turbines, ranging from 0.66 – 1.5 MW in size. Therefore, we used per megawatt estimates of raptor mortality for extrapolating the estimated numbers of raptor fatalities in the CPE. To estimate cumulative mortality of individual species, we assumed that species composition of bird and bat fatalities associated with 6700 MW of wind energy would be similar to species composition of fatalities found at the 16 existing facilities in the CPE, including 12 with quantified fatality estimates and four with raw data on species composition and number of fatalities. For example, American kestrels (*Falco sparverius*) composed 31.4% of the raptor fatalities found at existing wind-energy facilities. To estimate the total number of American kestrel fatalities associated with 6700 MW of wind energy development, we assumed that they would also compose 31.4% of the total cumulative number of raptor fatalities per year.

All Birds

Compared with raptors, there is little correlation between total numbers of birds (all species) observed during pre-construction surveys (most of which are song birds) and post-construction mortality, presumably because many of the collision fatalities are nocturnal migrants (see Table 1), which are not accounted for during diurnal surveys. In addition, the survey methods for quantifying use are more relevant for large birds than for small birds. Total bird use at 24 wind-energy facilities in the CPE has ranged from 5–23.6 birds/survey and averaged 13.4 birds/survey (Table 2). Total bird use at the 12 wind-energy facilities in eastern Washington and Oregon with

post-construction fatality data ranged from 5.0 birds/survey at Wild Horse to 23.6 birds/survey at Leaning Juniper, and averaged 12.0 birds/survey (Table 1). Because total bird use at proposed wind-energy facilities with pre-construction bird use data is within the range of similar bird use values for existing wind-energy facilities in the CPE, it is reasonable to assume that mortality of all birds combined at CPE wind-energy facilities would be similar to that observed at the 12 existing wind-energy facilities in the CPE. Therefore, we multiplied the total number of MW by 2.5 fatalities/MW/year (the mean among the 12 CPE wind-energy facilities) to estimate total bird mortality. To estimate total cumulative mortality by bird type and/or species, we assumed the fatalities associated with 6700 MW of wind energy would have the same group and species composition as fatalities found at existing wind-energy facilities in the CPE.

Bats

To estimate cumulative bat mortality for all projects in the CPE, we assumed that bat mortality would be similar to the existing wind-energy facilities located in the CPE. Therefore, we multiplied the total number of MW by the mean number of bat fatalities/MW/year at the other CPE Projects (1.20/MW/year). We estimated the total number of fatalities by species assuming species composition would be similar to the species composition of bat fatalities found at existing wind-energy facilities in the CPE.

RESULTS

Existing Data for CPE Projects

Raptors

Raptor use estimates and post-construction raptor fatality estimates are available for 12 wind-energy facilities in eastern Washington and Oregon. Pre-construction raptor use estimates at these wind-energy facilities have ranged from 0.26 raptors/survey at Nine Canyon, to 0.90 raptors/survey at Bighorn I, and averaged 0.52/survey (Table 2). Raptor mortality was not documented at four of these wind-energy facilities (Klondike I, Klondike III, Vansycle and Combine Hills) during one-year post-construction mortality surveys, and was relatively low at the other eight, ranging from 0.05/MW/year at Nine Canyon, Washington to 0.21/MW/year at Leaning Juniper, Oregon. Quantitative mortality estimates were not made for Condon, but only one raptor fatality was documented at that facility.

The 70 raptor fatalities found at CPE wind-energy facilities have composed 8.4% of the total bird mortality. Most of the raptor fatalities have been American kestrels (22 fatalities; 31.4%), red-tailed hawks (*Buteo jamaicensis*; 14 fatalities; 20.0%) and short-eared owls (*Asio flammeus*; 7 fatalities; 10.0%). Other raptors found as fatalities at CPE wind-energy facilities include six Swainson's hawks (*Buteo swainsonii*), four ferruginous hawks (*Buteo regalis*), three rough-legged hawks (*Buteo lagopus*), two of each of the following: great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), northern harrier (*Circus cyaneus*), unidentified buteo, and one each of the following: golden eagle (*Aquila chrysaetos*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), barn owl (*Tyto alba*), unidentified owl, and unidentified accipiter (Table 3).

All Birds

Eighty-nine species have occurred as fatalities at existing wind energy facilities in the CPE. Passerines (songbirds) have been the most abundant bird fatality at modern wind-energy facilities in western North America, comprising 59.3% of total bird fatalities (Johnson and Stephens 2010). Passerines are also the most commonly observed birds during pre-construction fixed-point bird use surveys at all of these sites. Both migrant and resident passerine fatalities have been observed. Songbird mortality at wind-energy facilities in eastern Oregon and Washington has been reasonably consistent among sites. Songbirds have composed 67.1% of the bird mortality at CPE wind-energy facilities. Horned larks (*Eremophila alpestris*) have been the most commonly observed songbird fatality in the CPE, composing 29.7% of all bird fatalities (Table 3), and have been the most abundant songbird observed during pre-construction fixed point bird use surveys at these sites. Based on long term Breeding Bird Survey (BBS) data, horned larks are likely one of the most common birds in the Columbia Plateau. No other resident songbird species comprised a large proportion of the fatalities observed at the wind-energy facilities in the CPE (Table 3). The one apparent migrant with the highest number of fatalities is the golden-crowned kinglet (*Regulus satrapa*; 47 fatalities; 5.6% of all fatalities).

Mourning doves (*Zenaida macroura*) and rock pigeons (*Columba livia*) have composed 4.3% of the mortality at CPE wind-energy facilities. Waterfowl, waterbirds and shorebirds have composed only 2.1% of the fatalities. Mortality compared to use by these groups is very low. For example, only two Canada goose fatalities were documented at the Klondike, Oregon wind-energy facility (Johnson et al. 2003a), even though 43 flocks totaling 4845 individual Canada geese were observed during pre-construction fixed-point bird use surveys (Johnson et al. 2002a). Shorebird use of wind-energy facilities in the CPE has been low, with the most common species being killdeer. Shorebirds as a group are rarely killed at wind-energy facilities; of 1247 avian fatalities collected at modern wind-energy facilities in western North America and summarized in Johnson and Stephens (2010), only three (0.2%) were shorebirds. Low shorebird mortality has occurred even though shorebirds have been recorded at virtually every wind-energy facility evaluated. Some waterfowl, shorebird and other waterbird mortality will occur at CPE wind-energy facilities, but based on all available data from other facilities, the numbers are expected to be low relative to the use of each area. Upland gamebirds documented during surveys of CPE wind-energy facilities include ring-necked pheasant (*Phasianus colchicus*), gray partridge (*Perdix perdix*), chukar (*Alectoris chukar*), and California quail (*Callipepla californica*). Upland gamebird mortality is fairly common, as upland gamebirds have comprised 9.6% of all fatalities at modern wind energy facilities in western North America, behind only passerines and raptors (Johnson and Stephens 2010). In the CPE, upland gamebirds are one of the most common fatalities, composing 12.6% of all identified fatalities (Table 4). Based on habitat present, results from other regional wind-energy facilities, and the presence of upland gamebirds during baseline surveys, some mortality of upland gamebirds is expected to occur at nearly all wind-energy facilities in the CPE.

Bats

Bat mortality estimates have been made for 11 existing wind-energy facilities in the CPE, where they ranged from 0.23–2.46 fatalities/MW/year, and averaged 1.20 fatalities/MW/year (Table 5). Bat mortality patterns at wind-energy facilities in Washington and Oregon have followed patterns similar to the rest of the country. Of 390 bat fatalities collected at existing wind-energy

facilities in eastern Oregon and Washington, 364 (93.4%) have been the two migratory species that occur in the CPE, including 180 hoary bats (*Lasiurus cinereus*) and 184 silver-haired bats (*Lasionycteris noctivagans*). The other mortalities have consisted of small numbers of big brown bats (*Eptesicus fuscus*), little brown bats (*Myotis lucifugus*), and unidentified bats (Table 6). Virtually all of the mortality has occurred in late summer and early fall, during the fall migration period for hoary and silver-haired bats.

Mortality Estimates and Population Consequences

Birds (Excluding Raptors)

For all birds combined, we estimate that total annual mortality in the CPE would be 16,750 birds/year. Despite several thousand bird fatalities from 6700 MW of wind power, these impacts are spread across numerous species and bird groups, as well as across seasons. Therefore, the overall impact to any given species or population of a species is substantially less. Based on species composition of fatalities at existing CPE wind-energy facilities (Table 3), passerines would compose approximately 67.1% of the fatalities, upland gamebirds would compose 12.6%, doves/pigeons would compose 4.3%, waterfowl/waterbirds/shorebirds would compose 2.1% and other bird types, such as woodpeckers, nighthawks and swifts, would compose 3.0%. Approximately 4.5% of the mortality would be composed of non-protected European starlings (*Sturnus vulgaris*), rock pigeons and house sparrows (*Passer domesticus*).

Raptors

Using raptor mortality estimates from existing wind energy facilities in the CPE, we estimate total raptor mortality in the CPE would be 516 fatalities per year. . American kestrels account for 31.4%, red-tailed hawks account for 20.0% and short-eared owls account for 10.0% of the raptor fatalities recorded at the regional wind projects studied (see Table 3). Assuming this trend holds true for all proposed wind-energy facilities in the CPE, and assuming there would be 516 raptor fatalities per year, it would be expected that on average 162 American kestrels, 103 red-tailed hawks and 52 short-eared owls would be killed each year.

The other species of raptors occurring in the CPE have had no or few fatalities at existing wind-energy facilities, and would likely represent a much smaller number of fatalities. For example, no peregrine falcon (*Falcon peregrinus*) or prairie falcon (*Falco mexicanus*) fatalities have been reported to date during standardized monitoring; therefore, our mortality estimate for these species is necessarily zero. Although one prairie falcon was found at the White Creek wind energy facility, it was an incidental fatality and was therefore not included in this analysis. Three species of concern in the region, golden eagle, ferruginous hawk and Swainson's hawk, have all been found as turbine collision victims in the CPE. Ferruginous hawks have composed 5.7% of the raptor fatalities, Swainson's hawks have composed 8.6%, and golden eagles have composed 1.4%. Assuming a total of 516 raptor fatalities could occur each year in the CPE, this would result in 29 ferruginous hawk, 44 Swainson's hawk, and seven golden eagle fatalities per year.

The three species of raptors with the largest expected numbers of fatalities due to wind energy development in the CPE are American kestrel, red-tailed hawk and short-eared owl. Raptor fatalities in the CPE have occurred throughout the year, with 23.1% in the spring, 43.1% in the summer,

21.5% in the fall, and 10.8% in the winter (Table 7). Approximately 56.9% of the raptor fatalities have occurred during the spring and fall migration, and during winter periods, when the affected population could contain birds from numerous local breeding populations in the Pacific Northwest as well as further north in Canada. Assuming approximately 43.1% of the mortality would occur during the breeding season, it would be expected that approximately 70 American kestrel, 44 red-tailed hawk and 22 short-eared owl fatalities would occur during the breeding season. An estimate of the breeding population in the Columbia Plateau, based on the BBS long-term average data, is approximately 170,000 breeding American kestrels, 77,000 breeding red-tailed hawks and 21,000 breeding short-eared owls (Blancher et al. 2007). Annual collision mortality in the CPE would represent approximately 0.04% of the breeding population of American kestrels, 0.06% of the breeding population of red-tailed hawks and 0.10% of the breeding population of short-eared owls. Even if we assumed all mortality (instead of 43.1%) would occur to adult breeding birds, this would still represent only 0.10%, 0.13% and 0.25% of the breeding American kestrels, red-tailed hawks and short-eared owls, respectively, in the CPE. Background mortality for these species is much higher than this estimate and the additional wind energy related mortality is likely insignificant from a population standpoint. Typical annual mortality rates for red-tailed hawks are 54% of juveniles, 20% of subadults, and 20% of adults. American kestrels suffer even higher mortality, as the annual mortality rate is 69% of juveniles and 45% of adults (Millsap and Allen 2006). Annual survival data are not available for short-eared owls (Wiggins et al. 2006). Given these numbers, plus the fact that most raptor populations can withstand additional harvest of nestlings and migrating birds by falconers of 10-20% or even higher (Millsap and Allen 2006), it is unlikely that the additional mortality of <0.30% associated with projected wind power development in the CPE would lead to measurable population effects for American kestrels, red-tailed hawks and short-eared owls. Based on an analysis of population sizes and survival rates, the US Fish & Wildlife Service conservatively estimates that falconers could harvest 13,216 juvenile red-tailed hawks and 19,575 juvenile American kestrels each year in the US without any consequences to populations (Millsap and Allen 2006). Actual harvest by falconers in 2004 was only 1062 raptors comprised of 15 species (Milsap and Allen 2006). Given these estimates of a sustainable harvest and the actual number of birds harvested, the number of birds killed in 2004 by wind turbines in North America should have fallen into a range of sustainable mortality.

Even though only four ferruginous hawk, six Swainson's hawk, and one golden eagle fatalities have been found at existing wind energy facilities in the CPE, these raptors are species of concern and warrant additional analysis. The ferruginous hawk is listed as threatened by the Washington Department of Fish and Wildlife (WDFW) and as "critical" by the Oregon Department of Fish and Wildlife (ODFW), while the Swainson's hawk is listed as "vulnerable" by the ODFW. The estimated breeding population in the CPE is 1000 ferruginous hawks (Blancher et al. 2007). Ferruginous hawks may occur in the CPE throughout the year and their populations include breeders, migrants and winter residents, as well as juveniles and adults. Given our estimate of 29 ferruginous hawk fatalities on an annual basis, even if all turbine mortality occurred to resident breeding adult birds, this would represent 2.9% of the breeding ferruginous hawks in the CPE. Because mortality would likely be spread out among migrants, winter residents, resident breeders, and juveniles as well as adults, mortality of adult ferruginous hawks actually breeding in the CPE would be less than 2.9%, likely on the order of 1–2%. According to Millsap and Allen (2006), ferruginous hawk populations can sustain 1% harvest rates (limited to juveniles) without affecting

populations. This harvest rate was considered conservative because it was modeled using data obtained from red-tailed hawk banding or marking studies, which typically greatly underestimate survival in raptors compared to telemetry studies. Therefore, the sustainable harvest rate is likely greater than 1%. To put a 1-2% mortality rate into perspective, we examined existing mortality rates of ferruginous hawks. A study of ferruginous hawks in Washington State found that annual adult mortality was 24%, and mortality of juvenile ferruginous hawks was 57% between the first and second year (Watson 2003). A ferruginous hawk banding study in Alberta, Canada found that first year mortality was 60% (Schmutz and Fyfe 1987), and a study of ferruginous hawks in Utah found that annual mortality was 25% for adults and 66% for juveniles the first year (Woffinden and Murphy 1989). Another study in Canada (Alberta and Saskatchewan) found that annual adult mortality was 29.2%, and first year mortality of nestlings was 45.5%. Despite annual adult mortality of 29.2%, the authors concluded that adult survival was not limiting the population; abundance of ground squirrels, which affected nesting success, appeared to be the primary factor regulating population size (Schmutz et al. 2008). Given published annual mortality rates for adult ferruginous hawks of 24–30%, additional losses of 1–2% of resident breeders associated with 6700 MW of wind energy development in the CPE would not likely have measurable population consequences.

The above analysis is for the entire population of 1000 ferruginous hawks in the CPE. It assumes that wind energy development and ferruginous hawk populations are spread uniformly across the entire CPE, which is not the case. Given the actual locations of existing and proposed wind energy facilities and ferruginous hawk population centers, actual impacts are likely lower. For example, the existing and proposed wind energy development in Klickitat County, Washington is approximately 1902 MW, or 28% of the 6700 MW of all currently existing and proposed wind energy development in the CPE. However, only three breeding pairs of ferruginous hawk are known to occur in the county (Jim Watson, Wildlife Research Scientist, Washington Department of Fish and Wildlife, pers. commun). Therefore, the county with the largest amount of wind energy development has a low breeding population of ferruginous hawks, which reduces the potential for significant impacts to this species across its entire range in the CPE. There is consequently little overlap between areas of intensive wind energy development and core breeding areas for ferruginous hawk, which further reduces the potential for cumulative impacts to this species. Although local populations of ferruginous hawk may be reduced in areas of intensive wind energy development, the evidence suggests that this impact is not likely to affect the ferruginous hawk population in the entire CPE.

Breeding Bird Survey data collected over the last 27 years (1980–2007) show a negative trend in population growth for ferruginous hawks in the CPE (Sauer et al. 2008), but the negative trend is not statistically significantly due to low sample sizes and uncertainty (Sauer et al. 2008). If ferruginous hawk populations are declining in the region, and wind energy development continues at its current rate of growth in the CPE, ferruginous hawk collision mortality could eventually reach a point that populations may begin to decline without some form of mitigation. Mitigation could include establishing conservation easements around ferruginous hawk breeding territories, erecting artificial nest structures, or otherwise improving habitat for ferruginous hawks in the CPE (Johnson et al. 2007).

The estimated Swainson's hawk breeding population in the CPE is 10,000 (Blancher et al. 2007). Unlike ferruginous hawks, Swainson's hawks occur in the CPE only during summer and most are resident breeders. Given our mortality estimate of 44 Swainson's hawks per year, this would represent only 0.44% of the Swainson's hawks in the CPE. Compared to many other raptor species, there is little data on annual survival of Swainson's hawks (England et al. 1997). The annual mortality rate of Swainson's hawks was reported in one study from western Canada, where it was estimated to be 15.7%, and nestling mortality rates ranged from 56–81% over the multi-year study (Schmutz et al. 2006). Given these mortality rates, additional losses of <0.5% would be considered sustainable and would not have measurable population consequences.

The golden eagle is federally protected by the Bald and Golden Eagle Protection Act and is listed as a candidate species by the WDFW, but does not have any special status in Oregon. The estimated breeding population in the CPE is 1770 (Blancher et al. 2007). Golden eagles may occur in the CPE throughout the year and their populations include breeders, migrants and winter residents, as well as juveniles and adults. Given our annual estimate of seven golden eagle fatalities, even if all turbine mortality occurred to resident breeding adult birds, this would represent 0.4% of the breeding golden eagles in the CPE. Because mortality would likely be spread out among migrants, winter residents, resident breeders, and juveniles as well as adults, mortality of adult golden eagles that breed in the CPE would be less than 0.4%. Mortality of golden eagles the first year after independence ranges from 54% to 82% (Kochert et al. 2002). At the Altamont Pass Wind Resource Area in California, mortality of radio-marked golden eagles was 16% the first year, 21% for floating birds one to three years old, and 9% for adult breeders (Hunt 2002). Based on a regression analysis of banding data, Harmata (2002) estimated that only 50% of golden eagles survive to the age of three years. Given these published mortality rates for golden eagles, additional losses of <0.4% of the population associated with 6700 MW of wind energy development in the CPE would not likely have measurable population consequences for golden eagles.

Upland Gamebirds

Upland gamebirds represent a higher percentage (12.6%) of the bird fatalities in the Columbia Plateau than in other regions in the US. No native upland gamebirds have been found as fatalities at wind-energy facilities in the CPE. All of the fatalities have been ring-necked pheasant, gray partridge, and chukar, which are all introduced species. Given our total bird mortality estimate of 16,750, approximately 2110 upland gamebird fatalities would be expected to occur on an annual basis.

The species most impacted, ring-necked pheasant, gray partridge, and chukar, are all common in mixed agricultural native grass/steppe habitats. Habitats throughout the Columbia Plateau are highly suitable for these species and the large populations likely influence the higher mortality rate for the regional wind-energy facilities. The total estimated population size of these three species combined in the CPE of Oregon and Washington is 370,900 (Blancher et al. 2007); therefore, wind energy fatalities would compose approximately 0.57% of the population. As with non-native (non-protected) passerine species, there is generally lower concern over impacts to exotic upland gamebirds. Given the vast amount of suitable habitat and the ability of these species to withstand harvest rates substantially higher than 0.57%, it is unlikely that additional fatalities from wind energy development would be significant from a population standpoint.

Waterfowl, Waterbirds and Shorebirds

Waterfowl, waterbirds and shorebirds represent a very small percentage (2.1%) of all fatalities at existing wind energy projects in the CPE. Based on our total bird mortality estimate of 16,750, approximately 352 fatalities could result on an annual basis.

Populations of waterfowl, waterbirds and shorebirds in the CPE are considerable. In addition, members of these groups are present year-round in the form of resident breeders, migrants, and winter residents. Given that we estimate only a few hundred individuals will be killed by turbine collisions on an annual basis, no cumulative impacts on these species are likely. In addition to killdeer, another shorebird commonly associated with upland habitats where wind-energy facilities are placed, is long-billed curlew. To date, however, only one fatality of this sensitive species has been documented at existing wind-energy facilities in the CPE.

Passerines

For projects in the CPE, approximately 67.1% of the bird fatalities have been passerines (Table 5). Assuming that 67.1% of all bird mortality would be composed of passerines, approximately 11,239 passerine fatalities would occur annually in the CPE. Of all passerine fatalities recorded during the regional monitoring studies, horned lark made up nearly half (44.3%) of the fatalities. Assuming this pattern holds for all CPE wind-energy facilities, it could be expected that on average there would be 4975 horned lark fatalities per year. Another common grassland breeder in the CPE, western meadowlark (*Sturnella neglecta*), composed approximately 4.8% of the passerine fatalities at wind-energy facilities, and therefore total annual mortality of this species related to wind turbine collisions would be approximately 540 individuals. At wind-energy facilities in the CPE, migrant passerines of several species generally composed approximately 30% of the bird fatalities (Table 1). Assuming these estimates are representative of all CPE wind-energy facilities, approximately 5025 nocturnal migrant fatalities would be expected per year if 6700 MW of wind power were constructed. The most common migrant fatality at existing wind-energy facilities in the CPE was golden-crowned kinglet (Table 3). Approximately 5.6% of the passerine fatalities were of this species; therefore, estimated annual mortality for this species would be approximately 938 individuals.

According to Blancher et al. (2007), the estimated size of the breeding population of horned larks in that portion of the CPE in Washington and Oregon is 2.2 million. Given our estimate of 4975 horned lark fatalities, and if it is assumed that the horned lark fatalities are spread equally over the year, then roughly 25% (~1244) of these fatalities would be during the breeding season. This represents approximately 0.06% of the breeding horned lark population. Given that most of the mortality will be composed of common species with widespread distribution and large populations, that annual mortality rates of song birds typically range from 30–70% (Lack 1966; Welty 1982), losses amounting to less than one percent are impacts to individuals, and therefore not significant from a population standpoint.

While this example represents a plausible means of addressing potential population impacts under a number of assumptions, it illustrates the low level of effect on the common grassland/agricultural species that comprise the largest portion of the fatalities. Similar examples could be used for the other species that illustrate lower effects. For example, the BBS data indicate the breeding

population of western meadowlarks in the CPE of Oregon and Washington is one million (Blancher et al. 2007). Given our estimate of 540 western meadowlark fatalities, the impact on the western meadowlark breeding population in the Columbia Plateau would be minor and insignificant. The number of fatalities from other species are even fewer (see Table 3) and unlikely to have any population effects.

In general, while modern turbines are getting taller, new wind-energy facilities do not appear to have a large impact on migrant birds. Results of marine radar surveys for proposed wind-energy facilities have indicated that the vast majority of nocturnal migrants fly at altitudes that do not put them at risk of collision with turbines (Young and Erickson 2006). Also, there have been only two multiple individual mortality events during a migration season reported at newer wind-energy facilities in the US. At Buffalo Ridge, Minnesota, fourteen migrating passerine fatalities (vireos, warblers, flycatchers) were observed at two turbines during a single night in May 2002 (Johnson et al. 2002b), and 33 migrating passerine fatalities (mostly warblers) were observed near one turbine and a well-lit substation at the Mountaineer, West Virginia, wind-energy facility in May 2004 (Kerns and Kerlinger 2004). At wind-energy facilities in the CPE, migrant passerines of several species generally composed approximately 30% of the bird fatalities. Some impacts are expected for nocturnal migrating species; however, impacts are not expected to be great for the CPE. The apparent migrant with the greatest number of collision fatalities is golden-crowned kinglet. Our annual mortality estimate for golden-crowned kinglet was 938, which would represent 0.13% of the estimated breeding population size of this species in the CPE of Oregon and Washington, which is 720,000 (Blancher et al. 2007). Golden-crowned kinglets are typically associated with forested habitats during the breeding season, so it is assumed that many of the impacted individuals were from surrounding mountainous ecoregions or populations further north (e.g., Canada), rather than from the CPE. As with horned lark, estimating the potential population size from which these birds came requires a number of assumptions. However, while the potential population size is unknown, it is possible that the individual fatalities came from several populations in surrounding or more northern ecoregions, thus further diluting the impacts on any one population. Other potential migrant species were found in lower numbers. Cumulatively the impacts to migrants would be spread over a much larger population base and are not considered significant.

Sensitive Bird Species

In addition to golden eagle and ferruginous and Swainson's hawks discussed above, other species classified as sensitive species by the WDFW and/or ODFW have been found as fatalities at CPE wind energy projects. These include long-billed curlew (*Numenius americanus*), Lewis's woodpecker (*Melanerpes lewis*), grasshopper sparrow (*Ammodramus savannarum*), sage thrasher (*Oreoscoptes montanus*), sage sparrow (*Amphispiza belli*) and Vaux's swift (*Chaetura vauxi*). Only one fatality of each of the above species has been found at CPE wind energy projects. Given that 837 bird fatalities have been found at these projects and estimated total bird mortality is 16,750, the estimated mortality for each of these species would be approximately 20 fatalities per year. The estimated population sizes of each of these species in the CPE based on Blancher et al. (2007) is 25,000 Lewis's woodpeckers, 149,000 grasshopper sparrows, 1,060,000 sage thrashers, 314,000 sage sparrows, and 110,000 Vaux's swifts; no estimate was provided for long-billed curlew. Given these estimated populations sizes, the loss of 20 individuals per year would not have measurable population consequences.

Bats

Based on bat mortality estimates at the other regional wind-energy facilities, total bat mortality in the CPE was estimated at 8040 per year. Based on species composition of bat fatalities found at CPE wind-energy facilities, approximately 3795 silver-haired and 3714 hoary bat fatalities would occur in the CPE on an annual basis.

Unlike birds, there is little information available about population sizes of most bat species, especially the non-hibernating, solitary tree-roosting species that compose most of the wind-energy facility related mortality in North America. Results of monitoring studies across the US and Canada have found similar trends in impacts. Risk to bats from wind turbines is unequal across species and across seasons. The majority of bat fatalities at wind projects in western North America have been tree roosting bats that are long-distance migrants (Johnson and Stephens 2010). Silver-haired bats throughout the US and species in the *Lasiurus* genus, the hoary bat in the western U.S. and the eastern red bat (*L. borealis*) in the Midwest and eastern U.S., are the most abundant fatalities found at wind-energy facilities. Less common fatalities include big brown bats and *Myotis* species (Arnett et al. 2008, Johnson 2005, Johnson and Stephens 2010). The highest mortality occurs during the fall migration period for bats, from roughly late-July through September (Arnett et al. 2008, Johnson 2005). Much lower mortality rates occur in the spring and summer, particularly in the CPE.

More recently, studies at different locations in the US and Canada appear to indicate that bat mortality is not related to site features or habitat, and dissimilar results for ecologically similar facilities have been found (Baerwarld and Barclay 2009). While it is hypothesized that eastern deciduous forests in mountainous areas may be the highest risk areas, relatively high bat mortality has also occurred at wind-energy facilities in prairie/agricultural settings (Alberta, Canada; Baerwald 2008) and row crop agricultural settings in the Midwestern US (Jain 2005, Gruver et al. 2010). Bat mortality in the CPE would involve primarily silver-haired and hoary bats. Most mortality is observed during the fall migration period. The regional monitoring studies suggest resident bats do not appear to be significantly affected because very low numbers of resident bat species have been observed as fatalities. One species of potential concern is the Townsend's big-eared bat (*Corynorhinus townsendii*), a state candidate species in Washington. Very little is known about the current distribution of Townsend's big-eared bat in Washington. According to Marshall et al. (1996) the subspecies *Corynorhinus townsendii pallescens* occurs east of the Cascade Range, within the CPE. A Biological Assessment prepared to address the potential for a wind-energy facility in West Virginia to impact the federally endangered Virginia big-eared bat (*Corynorhinus townsendii virginianus*), a subspecies of Townsend's big-eared bat, concluded that the collision risk to this species is very low because it is non-migratory and forages well below the space occupied by turbine blades (Johnson and Strickland 2003). These conclusions are also likely applicable to Townsend's big-eared bat, and to date no fatalities of this species have been found at any wind energy facility in the CPE.

Hoary bats and silver-haired bats occupy forested habitats during the breeding season – habitat distinctly lacking and localized throughout the CPE. The significance of wind energy impacts on hoary and silver-haired bat populations is difficult to predict, as there is no information available on the overall population sizes of these bats. However, hoary and silver-haired bats are widely

distributed throughout North America. Most concern over impacts to bats is with wind-energy facilities built on ridgetops in the Appalachian Mountains, where mortality levels have been as high as 39.7 bat fatalities/MW/year (Kerns et al. 2005), substantially higher than the average of 1.20 bat fatalities/MW/year observed in the Pacific Northwest.

In general, mortality levels on the order of one to two bats per MW are likely not significant to populations, although cumulative effects may have greater consequences for long-lived, low-fecundity species such as bats. Unlike many bird species that may have multiple clutches of multiple young per year, bats are long-lived species with relatively low reproductive rates. For example, hoary and silver-haired bats typically produce only two young per year (Shump and Shump 1982, Kunz 1982). As such, their populations are much slower to recover from large fatality events than other species, such as most birds, that have much higher reproductive rates. Bats tend to live longer than birds, however, and may have a longer breeding lifespan. The impact of the loss of breeding individuals to populations such as these may have greater consequences.

Because migratory tree bats are primarily solitary tree dwellers that do not hibernate, it has not been possible to develop any suitable field methods to estimate their population sizes (Carter et al. 2003). As a result, impacts on these bat species caused by wind energy development cannot be put into perspective from a population impact standpoint. To help solve this problem, population genetic analyses of DNA sequence and microsatellite data are being conducted to provide effective population size estimates, to determine if populations are growing or declining, and to see if these populations are comprised of one large population or several discrete subpopulations that use spatially segregated migration routes (Amy L. Russell, Assistant Professor, Grand Valley State University, Allendale, Michigan, pers. commun.).

Since it is most likely breeding populations from surrounding mountainous/forested ecoregions or from more northern areas (e.g., Canada) are affected at the Columbia Plateau wind-energy facilities during the fall migration, the dynamics of these populations would need to be known to predict population effects. For large and stable populations the level of impact is not expected to be significant, although impacts could be more pronounced for less stable populations. Bat Conservation International (BCI), the American Wind Energy Association (AWEA), the US Fish & Wildlife Service (USFWS), and the US Department of Energy National Renewable Energy Laboratory (NREL) have initiated a research effort termed the Bat Wind Energy Cooperative to conduct research and further understand bat and wind turbine interactions and how to prevent or minimize bat fatalities at wind energy facilities.

Indirect Effects

Grassland and shrub-steppe communities are the most abundant native communities in the CPE, but they are also highly subjected to development and conversion to agriculture (Johnson and O'Neil 2001). In addition to potentially thousands of new vertical structures, added wind energy generation in the region will result in more roads (mostly dirt and gravel) and increased human activity due to turbine construction and maintenance. A substantial portion of these impacts will be to already heavily-disturbed agricultural fields and moderately disturbed rangeland used for

livestock grazing. The percent of direct impacts actually occurring in native grassland or shrub-steppe habitat are difficult to predict and would be based on individual facility design and layout. However, based on the community types that existing wind-energy facilities are located in, we assume that approximately 25% of the existing and proposed facilities would be in cultivated cropland. Based on terrestrial vegetative communities in the CPE (Figure 2), only seven of the 47 existing or proposed wind energy facilities as of late 2008 were in communities classified as shrub steppe, with two additional facilities in areas classified as grasslands. The remaining facilities were all within vegetative communities classified by Quigley and Arbelbeide (1997) as agricultural lands. These lands include croplands as well as rangelands used for cattle grazing, but are apparently degraded such that they are no longer classified as shrublands or grasslands. Therefore, most of the wind energy facilities in the CPE are in areas already degraded to some extent from conversion to pastures and cultivated cropland.

Assuming that on average the permanent impacts associated with a turbine and the associated access roads are 1.5 acres per turbine, and that 1.5-3.0 MW turbines are used for all new projects in the foreseeable future, then approximately 5000 acres (7.8 mi^2) of non-agricultural vegetation types, primarily grassland shrub-steppe vegetation, would be lost in the CPE with 6700 MW of wind energy. These impacts would be spread over a large area geographically (see Figure 1). Given that the CPE is 32,096 mi^2 in size, permanent impacts associated with 6700 MW of wind energy development would represent only 0.02% of the area.

While the CPE covers a large area, and characteristic grassland shrub-steppe habitat is widespread, it is also heavily fragmented by agricultural activities. Species that depend on native habitat face physical and ecological barriers within the region and at the region's edges. The Columbia River, and other smaller rivers in the area, cut deep canyons and present linear alteration to the general physiography and potential barriers to some animal species movement. Large swaths of agricultural land are less obvious, but may pose significant obstacles to small or less mobile animals. While many birds are not impeded by such physical barriers, some smaller, habitat-specific birds that depend on brushy habitats for cover could be affected by such habitat fragmentation. Habitat specialists and obligates such as greater sage-grouse (*Centrocercus urophasianus*) and sage sparrow (*Amphispiza belli*) require large tracts of continuous sage habitat (Johnson and O'Neil 2001), which is largely missing from the Columbia Plateau, and the range for these species in the Columbia Plateau is already severely restricted. Assuming that agricultural vegetation types are not important wildlife habitat, habitat loss impacts are not expected to be a significant loss to any given species within the entire CPE. However, because existing and proposed wind-energy facilities tend to be concentrated within certain regions within the CPE (see Figure 1), habitat loss may lead to localized population declines of some species.

In addition to direct effects through collision mortality, wind-energy development results in direct loss of habitat where infrastructure is placed and indirect loss of habitat through behavioral avoidance and habitat fragmentation. Direct loss of habitat associated with wind-energy development is relatively minor compared to most other forms of energy development. Although wind-energy facilities can cover substantial areas, the permanent footprint of facilities such as the turbines, access roads, maintenance buildings, substations and overhead transmission

lines, generally occupies only 5 to 10% of the entire development area (Bureau of Land Management [BLM] 2005). Estimates of temporary construction impacts range from 0.2 to 1.0 ha (0.5 to 2.5 ac) per turbine (AWEA 2009). Behavioral avoidance, however, may reduce habitat suitability over much larger areas for some species of wildlife, depending on how far a species is displaced from wind-energy facilities. The greatest concern with displacement impacts in western North America has been where facilities were constructed in native habitats such as grasslands or shrublands (Leddy et al. 1999, Mabey and Paul 2007).

Most studies on raptors at wind-energy facilities indicate displacement effects to be negligible. A before-after/control impact study of avian use at the Buffalo Ridge wind-energy facility in Minnesota found evidence that northern harriers (*Circus cyaneus*) avoided turbines on a small scale (< 100 m [328 ft] from turbines) and large scales (range of 105 - 5,364 m [345 – 17,598 ft]) in the year following construction (Johnson et al. 2000a). Two years following construction, however, no large-scale displacement was detected. The only published report of avoidance of wind turbines by nesting raptors occurred at the Buffalo Ridge facility, where raptor nest density on 101 mi^2 (261.6 km^2) of land surrounding the facility was 5.94 nests/39 mi^2 (5.94 nests/101.0 km^2) yet no nests were present in the 12 mi^2 (31.1 km^2) facility itself, even though habitat was similar (Usgaard et al. 1997). At a facility in eastern Washington, raptors still nested in the study area at approximately the same levels after construction, and several nests were located within a half-mile (0.8 km) of turbines (Erickson et al. 2004). Howell and Noone (1992) found similar numbers of raptor nests before and after construction of Phase 1 of the Montezuma Hills facility in California, and anecdotal evidence indicates that raptor use of the Altamont Pass wind resource area in California may have increased since installation of wind turbines (Orloff and Flannery 1992, AWEA 1995). At the Foote Creek Rim wind-energy facility in southern Wyoming, one pair of red-tailed hawks nested within 0.3 miles (0.5 km) of the nearest turbine, and seven red-tailed hawk nests, one great horned owl (*Bubo virginianus*) nest, and one golden eagle nest located within one mile (1.6 km) of the facility successfully fledged young (Johnson et al. 2000b, Western EcoSystems Technology, Inc. [WEST] unpublished data). The golden eagle pair successfully nested a half-mile (0.8 km) from the facility for three different years after the project became operational.

Studies in western North America concerning displacement of non-raptor species have concentrated on grassland passerines and waterfowl. Wind-energy facility construction appears to cause small-scale local displacement of some grassland passerines and is likely due to the birds avoiding turbine noise and maintenance activities. Construction also reduces habitat effectiveness because of the presence of access roads and large gravel pads surrounding turbines (Leddy 1996, Johnson et al. 2000a). Leddy et al. (1999) surveyed bird densities in Conservation Reserve Program (CRP) grasslands at the Buffalo Ridge wind-energy facility in Minnesota, and found mean densities of 10 grassland bird species were four times higher at areas >180 m (591 ft) from turbines than they were at grasslands nearer turbines. Johnson et al. (2000a) found reduced use of habitat within 100 m of turbines by seven of 22 grassland-breeding birds following construction of the Buffalo Ridge facility. At the Stateline wind-energy facility in Oregon and Washington, use of areas <50 m from turbines by grasshopper sparrow (*Ammodramus savannarum*) was reduced by approximately 60%, with no reduction in use >50 m from turbines (Erickson et al. 2004). At the Combine Hills facility in Oregon, use of areas

within 150 m of turbines by western meadowlark was reduced by 86%, compared to a 12.6% reduction in use of reference areas over the same time period (Young et al. 2005a). Horned larks, however, showed significant increases in use of areas near turbines at both of these facilities, likely because this species prefers areas of bare ground such as those created by turbine pads and access roads (Beason 1995).

Shaffer and Johnson (2008) examined displacement of grassland birds at two wind energy facilities in the northern Great Plains. Intensive transect surveys were conducted on plots with and without turbines. The study focused on five species at two study sites, one in South Dakota and one in North Dakota. Based on this analysis, killdeer (*Charadrius vociferous*), western meadowlark, and chestnut-collared longspur (*Calcarius ornatus*) showed no avoidance of wind turbines. However, grasshopper sparrow and clay-colored sparrow (*Spizella pallida*) showed avoidance out to 200 m (656 ft).

At the Buffalo Ridge facility, the abundance of several bird types including shorebirds and waterfowl was significantly lower at survey plots with turbines than at reference plots without turbines, indicating that the area of reduced use was limited primarily to areas within 100 m of the turbines (Johnson et al. 2000a). These results are similar to those of Osborn et al. (1998), who reported that birds at Buffalo Ridge avoided flying in areas with turbines.

Populations of mountain plovers (*Charadrius montanus*) at the Foote Creek Rim wind-energy facility in Wyoming declined during construction but have slowly increased since, although not to the same level present prior to construction. It is not known if the initial decline or subsequent increase was due to presence of the wind-energy facility or to regional changes in mountain plover populations. Nevertheless, some mountain plovers have apparently become habituated to the turbines, as 11 of 28 nests found during surveys (39%) were located within 75 m (246 ft) of turbines (Young et al. 2005b).

Breeding dabbling ducks (mallard, blue-winged-teal [*Anas discors*], gadwall [*A. strepera*], northern pintail [*A. acuta*], and northern shoveler [*A. clypeata*]) were counted on wetland complexes at two wind-energy facilities and similar reference areas in North and South Dakota during the 2008 breeding season (Walker et al. 2008, unpublished report). Breeding duck numbers were similar between developed and undeveloped areas. The study is continuing through 2010 to further assess response of breeding ducks to wind-energy development.

The CPE wind energy facilities will be sited in vegetation communities common to the region, and other similar vegetation types are abundant. Furthermore, the actual area occupied by turbines and other infrastructure in a typical modern wind energy facility is only 5-10% of the total project area (BLM 2005). However, it is not known if displaced individuals simply move somewhere else and breed successfully, have reduced breeding success, do not breed at all, or some combination of the above. In addition, habitat fragmentation and disturbance from turbines and maintenance activities may make the entire wind-energy facility unsuitable for some species. If this occurs, a reduction in the number of breeding birds within the wind-energy facility and adjacent areas may occur, and the effect may be more pronounced in areas with concentrated facilities in circumstances where habitat is a limiting factor. However, the total area occupied by wind-energy facilities is only a small

fraction of the CPE (see Figure 1), and measurable population impacts are not likely for the entire region.

DISCUSSION

Mortality estimates for this analysis were based on species composition of fatalities found at 16 existing wind energy facilities in the CPE. Sample sizes for this analysis were relatively small for some groups. For example, we estimated ferruginous hawk mortality assuming that they would compose 5.7% of all raptor fatalities based on four ferruginous hawk fatalities out of 70 raptor fatalities found at the existing wind energy facilities. This ratio could easily change as additional fatality data are collected at new wind energy facilities in the CPE.

Our cumulative mortality estimates should be considered tentative, as no comparable fatality data exist for the large 2.0-3.0 MW turbines proposed for many of the future wind-energy facilities in the CPE. These estimates assume bird and bat fatality rates for a 3.0-MW turbine would be twice as high as a 1.5-MW turbine, which may not be accurate. Although the 2.0-3.0 MW turbines have a larger rotor diameter, which may increase collision risk to raptors, the rotor-swept area is higher off the ground and the turbine rotates at slower speeds, which may actually reduce risk to some raptors. Based on an analysis of avian fatality data at wind farms with turbines ranging in size from 0.04–1.8 MW, tower heights ranging from 24–94 m and rotor diameters ranging from 15–80 m, Barclay et al. (2007) concluded that avian fatality rates were not affected by any of these parameters. Therefore, inflating our estimates to account for larger turbines may lead to over-estimates of avian mortality.

This cumulative effects analysis was based largely on results of existing studies of wind-energy facilities in the region, and in particular monitoring studies that estimated the direct impacts of a particular wind-energy project. The overall design for these studies incorporates several assumptions or factors that affect the results of the fatality estimates. First, all bird casualties found within the standardized search plots during the study periods were included in the analyses. It is assumed that carcass found incidentally within a search plot during other activities would have been found during a standardized carcass search. Second, it was assumed that all carcasses found during the studies were due to collision with wind turbines. True cause of death is unknown for most of the fatalities. It is highly likely that some of the casualties included in the data pool for the various projects were due to natural causes or background mortality such as predation, disease, other natural causes, or manmade causes such as farming activity or vehicles on county/project roads. The overall effect of these assumptions is that the analyses provide a conservative estimate (an overestimate) of mortality.

This cumulative impacts analysis assumed that up to 6700 MW of wind energy could be developed in the CPE. However, based on recent estimates by the Northwest Power and Conservation Council (NPCC), which recognize constraints on wind development, such as transmission capacity, the NPCC projects that 5577 MW of wind energy development will be installed by the year 2013 (Jeff King, Senior Resource Analyst, presentation to the Northwest Wind Integration Forum Steering Committee, January 7, 2010). Because our estimates of bird and bat fatalities assuming that 6700 MW of wind energy would be developed are likely

overestimates, for comparison purposes we also derived estimates assuming that 5577 MW of wind energy would be developed (Table 8).

A few studies of wind-energy facilities in other regions of the country have provided information on background mortality. During a four-year study at Buffalo Ridge, Minnesota, 2482 fatality searches were conducted on study plots without turbines to estimate reference mortality in the study area. Thirty-one bird fatalities comprising 15 species were found (Johnson et al. 2000a). Reference mortality adjusted for searcher efficiency and carcass removal for the study was estimated to average 1.1 fatalities per plot per year. At a second study, pre-project carcass searches were conducted at a proposed wind-energy facility in Montana (Harmata et al. 1998). Three bird fatalities were found during eight searches of five transects, totaling 10.94 miles (17.61 km) per search. On average, approximately 1.12 miles (1.8 km) of transect are searched within each turbine plot in the referenced studies for the CPE (Table 2). The amount of transect searched at the Montana site per search was equivalent to searching approximately seven to nine turbines for the regional studies. The background estimate for observed mortality would be approximately 0.33 per turbine plot per year, unadjusted for scavenging and searcher efficiency. The background mortality information from the Minnesota and Montana studies suggests that the estimates of bird mortality include some fatalities not related to turbine collision, and this factor alone would lead to an over-estimate of actual bird collision mortality for wind-energy facilities.

Avian population estimates used in this analysis relied on breeding bird survey (BBS) data, and some of these estimates had relatively large standard errors. Thogmartin et al. (2006) reviewed the population estimation approach used by Blancher et al. (2007) and concluded that because BBS data were designed to detect long-term population trends, use of these data for estimating population sizes may be questionable. Regardless of these concerns, in order to estimate cumulative impacts, information on sizes of affected populations is required, and the population estimates provided by Blancher et al. (2007) are the only ones available for the CPE.

Finally, this cumulative impacts assessment only examined cumulative impacts of birds and bats due to wind energy development in the CPE. Wind energy development is only one factor affecting wildlife populations in the CPE, and is likely minor compared to other past, present, and future actions in the CPE, including large-scale conversion of native shrublands and grasslands to crop land; expansion of urban areas and rural subdivisions; road and highway construction; energy development, including dams for hydropower; and increases in other infrastructure, such as communication towers and power lines. For example, a review conducted by Erickson et al. (2001) found that wind energy contributes only a minor fraction of the overall avian collision mortality in the US due to powerlines, roads, communication towers and other structures. The ability to estimate wind energy development impacts on wildlife is unique because several studies have been conducted in the CPE to quantify bird and bat impacts. Similar estimates of bird and bat impacts due to direct mortality and loss or fragmentation of habitat caused by other activities are not available.

REFERENCES

American Wind Energy Association (AWEA). 1995. Avian Interactions with Wind Energy Facilities: a Summary. Prepared by Colson & Associates for AWEA, Washington, D.C.

American Wind Energy Association (AWEA). 2009. AWEA Website. Home page: http://www.awea.org/; Current U.S. wind energy capacity by state (updated September 2009): http://www.awea.org/projects/

Arnett, E.B., W.K. Brown, W.P. Erickson, J.K. Fiedler, B.L. Hamilton, T.H. Henry, A. Jain, G.D. Johnson, J. Kerns, R.R. Koford, C.P. Nicholson, T. O'Connell, M.D. Piorkowski, and R.D Tankersley, Jr. 2008. Patterns of bat fatalities at wind energy facilities in North America. *Journal of Wildlife Management* 72: 61-78.

Baerwald, E.F. 2008. Variation in the Activity and Fatality of Migratory Bats at Wind Energy Facilities in Southern Alberta: Causes and Consequences. Thesis. University of Calgary, Calgary, Alberta, Canada.

Baerwald, E.F. and R. M. R. Barclay. 2009. Geographic variation in activity and fatality of migratory bats at wind energy facilities. Journal of Mammalogy 90:1341–1349.

Barclay, R.M.R., E.F. Baerwald, and J.C. Gruver. 2007. Variation in bat and bird fatalities at wind energy facilities: assessing the effects of rotor size and tower height. Canadian Journal of Zoology 85:381-387.

Beason, R. C. 1995. Horned Lark (*Eremophila alpestris*). *In* The Birds of North America, No. 195 (A. Poole and F. Gill, Eds.). The Birds of North America, Inc., Philadelphia, PA.

Blancher, P.J., K.V. Rosenberg, A.O. Panjabi, B. Altman, J. Bart, C.J. Beardmore, G.S. Butcher, D. Demarest, R. Dettmers, E.H. Dunn, W. Easton, W.C. Hunter, E.E. Inigo-Elias, D.N. Pashley, C.J. Ralph, T.D. Rich, C.M. Rustay, J.M. Ruth, and T.C. Will. 2007. Guide to the Partners in Flight Population Estimates Database. Version: North American Landbird Conservation Plan 2004. Partners in Flight Technical Series No. 5. http://www.partnersinflight.org/

Bureau of Land Management (BLM). 2005. Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM Administered Land in the Western United States. U.S. Department of the Interior (USDOI), BLM, Washington, D.C. http://windeis.anl.gov/

Carter, T.C., M.A. Menzel, and D.A. Saugey. 2003. Population Trends of Solitary Foliage-Roosting Bats. *In*: Monitoring Trends in Bat Populations of the United States and Territories: Problems and Prospects. Biological Resources Discipline, Information, and Technology Report. U.S. Geological Survey (USGS). USGS/BRD/ITR-2003-003. T. J. O'Shea and M. A. Bogan, eds. Pp. 41-47. http://www.fort.usgs.gov/products/publications/21329/21329.pdf

England, A. Sidney, Marc J. Bechard and C. Stuart Houston. 1997. Swainson's Hawk (Buteo swainsoni), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/265doi:10.2173/bna.265

Erickson, W.P., G.D. Johnson, M.D. Strickland, and K. Kronner. 2000. Avian and bat mortality associated with the Vansycle Wind Plant, Umatilla County Oregon. 1999 study year. Technical report submitted to Umatilla County Department of Resource Services and Development, Pendleton, Oregon. 22 pp.

Erickson, W.P., G.D. Johnson, M.D. Strickland, D.P. Young, Jr., K.J. Sernka and R.E. Good. 2001. Avian collisions with wind turbines: A summary of existing studies and comparisons to other sources of avian collision mortality in the United States. National Wind Coordinating Committee Publication. http://www.nationalwind.org/pubs/default.htm

Erickson, W.P., B. Gritski, and K. Kronner. 2003. Nine Canyon Wind Power Project Avian and Bat Monitoring Report, September 2002 – August 2003. Technical report submitted to Energy Northwest and the Nine Canyon Technical Advisory Committee.

Erickson, W.P., J. Jeffrey, K. Kronner, and K. Bay. 2004. Stateline Wind Project Wildlife Monitoring Final Report, July 2001 – December 2003. Technical report peer-reviewed by and submitted to FPL Energy, the Oregon Energy Facility Siting Council, and the Stateline Technical Advisory Committee.

Erickson, W.P., K. Kronner, and K.J. Bay. 2007. Stateline II Wind Project Wildlife Monitoring Report, January – December 2006. Technical report submitted to FPL Energy, the Oregon Energy Facility Siting Council, and the Stateline Technical Advisory Committee.

Erickson, W.P., J.D. Jeffrey, and V.K. Poulton. 2008. Puget Sound Energy Wild Horse Wind Facility Post-Construction Avian and Bat Monitoring: First Annual Report, January – December 2007. Prepared by WEST, Inc. for Puget Sound Energy, Ellensburg, WA.

Fishman Ecological Services, LLC. 2003. Carcass survey results for SeaWest Windpower, Inc., Condon Site, 2002-2003. Prepared for SeaWest WindPower, Inc., Condon Wind Project, Gilliam County, Oregon.

Gill, J.P., M. Townsley, and G.P. Mudge. 1996. Review of the Impacts of Wind Farms and Other Aerial Structures Upon Birds. Scottish Natural Heritage Review No. 21. Scottish Natural Heritage. Battleby, United Kingdom.

Gritski, B., K. Kronner, and S. Downes. 2008. Leaning Juniper Wind Power Project, 2006 − 2008 Wildlife Monitoring Final Report. Unpublished Report *Prepared for* PacifiCorp Energy by Northwest Wildlife Consultants, Inc., Pendleton, OR.

Gritski, B., S. Downes, and K. Kronner. 2009. Klondike IIIa (Phase 2) Wind Power Project Wildlife Monitoring Year One Summary: August 2008–August 2009. Unpublished report prepared for Iberdrola Renewables by Northwest Wildlife Consultants.

Gruver, J., M. Sonnenburg, K. Bay and W. Erickson. 2010. Post-Construction Bat and Bird Fatality Study at the Blue Sky Green Field Wind Energy Center, Fond du Lac County, Wisconsin July 21, 2008 – October 31, 2008 and March 15, 2009 – June 4, 2009. Unpublished report prepared by WEST, Inc., Cheyenne, Wyoming.

Harmata, A. R. 2002. Encounters of Golden Eagles banded in the Rocky Mountain West. J. Field Ornithol. 73:23-32.

Harmata, A., K. Podruzny, and J. Zelenak. 1998. Avian Use of Norris Hill Wind Resource Area, Montana. National Renewable Energy Laboratory, Golden, CO. NREL/SR-500-23822

Howell, J.A. and J. Noone. 1992. Examination of Avian Use and Mortality at a U.S. Windpower Wind Energy Development Site, Montezuma Hills, Solano County, California. Final Report to Solano County Department of Environmental Management, Fairfield, California. 41pp.

Hunt, G. 2002. Golden eagles in a perilous landscape: predicting the effects of mitigation for wind turbine blade-strike mortality. California Energy Commission Report P500-02-043F.

Jain, A. 2005. Bird and Bat Behavior and Mortality at a Northern Iowa Windfarm. M.S. Thesis. Iowa State University, Ames, Iowa.

Johnson, D.H. and T.A. O'Neil (managing editors). 2001. *Wildlife-Habitat Relationships in Oregon and Washington.* Oregon State University Press, Corvallis, OR. 768 pp.

Johnson, G.D. 2005. A review of bat collision mortality at wind-energy developments in the United States. Bat Research News 46:45-49.

Johnson, G.D. and W.P. Erickson. 2008. Avian and Bat Cumulative Impacts Associated with Wind Energy Development in the Columbia Plateau Ecoregion of Eastern Washington and Oregon. Final Report prepared for Klickitat County Planning Department, Goldendale Washington. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming. October 30, 2008.

Johnson, G.D. and S. Stephens. 2010. Wind Power and Bio Fuels: A Green Dilemma for Wildlife Conservation. Chapter 9 *In*: Energy Development and Wildlife Conservation in Western North America. D. E. Naugle, Ed., Island Press, Washington, D.C. In Press.

Johnson, G.D. and M.D. Strickland. 2003. Biological Assessment for the Federally Endangered Indiana Bat (*Myotis sodalis*) and Virginia Big-Eared Bat (*Corynorhinus townsendii virginianus*), Nedpower Mount Storm Wind Project, Grant County, West Virginia. Unpublished report prepared for NedPower Mount Storm LLC, Chantilly, Virginia, by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming. October 8, 2003. http://www.west-inc.com.

Johnson, G.D., W.P. Erickson, M.D. Strickland, M.F. Shepherd and D.A. Shepherd. 2000a. Avian Monitoring Studies at the Buffalo Ridge Wind Resource Area, Minnesota: Results of a 4-year study. Technical report prepared by WEST, Inc. for Northern States Power Co., Minneapolis, MN. 212pp.

Johnson, G. D., D. P. Young, Jr., C. E. Derby, W. P. Erickson, M. D. Strickland, and J. W. Kern. 2000b. Wildlife monitoring studies, SeaWest Windpower Plant, Carbon County, Wyoming, 1995-1999. Technical Report prepared by WEST, Inc. for SeaWest Energy Corporation and Bureau of Land Management. 195pp.

Johnson, G.D., W.P. Erickson, and K. Bay. 2002a. Baseline Ecological Studies For the Klondike Wind Project, Sherman County, Oregon; Final Report prepared for Northwest Wind Power, Goldendale, Washington.

Johnson, G.D., W.P. Erickson, M.D. Strickland, M.F. Shepherd, D.A. Shepherd, and S.A. Sarappo. 2002b. Collision mortality of local and migrant birds at a large-scale wind power development on Buffalo Ridge, Minnesota. *Wildlife Society Bulletin* 30: 879-887.

Johnson, G., W. Erickson, J. White, R. McKinney. 2003a. Avian and Bat Mortality During the First Year of Operation at the Klondike Phase I Wind Plant, Sherman County, Oregon. Technical report prepared for Northwestern Wind Power, Goldendale, Washington. March 2003.

Johnson, G.D., M.D. Strickland, W.P. Erickson, and D.P. Young, Jr. 2007. Use of data to develop mitigation measures for wind power development impacts to birds. Pages 241-257 *In* Birds and Wind Farms, Risk Assessment and Mitigation. M. de Lucas, G.F.E. Janss, and M. Ferrer, (eds.). Quercus Press, Madrid, Spain.

Kerns, J. and P. Kerlinger. 2004. A Study of Bird and Bat Collision Fatalities at the Mountaineer Wind Energy Center, Tucker County, West Virginia: Annual Report for 2003. Technical Report prepared for FPL Energy and Mountaineer Wind Energy Center Technical Review Committee. Curry and Kerlinger, LLC. 39 pp.

Kerns, J., W.P. Erickson, and E.B. Arnett. 2005. Bat and Bird fatality at wind energy facilities in Pennsylvania and West Virginia. Pages 24-95 *in* E.B. Arnett, technical editor, Relationships between bats and wind turbines in Pennsylvania and West Virginia: an assessment of bat fatality search protocols, patterns of fatality, and behavioral interactions with wind turbines. A final report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International. Austin, Texas, USA.

Kochert, M. N., K. Steenhof, C. L. Mcintyre and E. H. Craig. 2002. Golden Eagle (Aquila chrysaetos), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/684doi:10.2173/bna.684

Kronner, K., R. Gritski, and S. Downes. 2008. Big Horn Wind Power Project Wildlife Monitoring Final Report, 2006-2007. Technical report prepared by Northwest Wildlife Consultants, Inc., Goldendale, WA. Prepared for PPM Energy and the Big Horn Technical Advisory Committee.

Kunz, T.H. 1982. Silver-haired Bat, *Lasionycteris noctivagans*. Mammalian Species 172:1-5.

Lack, D. 1966. Population Studies of Birds. Clarendon Press, Oxford.

Leddy, K.L. 1996. Effects of wind turbines on nongame birds in Conservation Reserve Program grasslands in southwestern Minnesota. M.S. Thesis, South Dakota State Univ., Brookings. 61pp.

Leddy, K.L., K.F. Higgins, and D.E. Naugle. 1999. Effects of wind turbines on upland nesting birds in Conservation Reserve Program grasslands. Wilson Bull. 111:100-104.

Mabey, S. and E. Paul. 2007. Impact of Wind Energy and Related Human Activities on Grassland and Shrub-Steppe Birds. A Critical Literature Review Prepared for the National Wind Coordinating Committee (NWCC) and The Ornithological Council. 183 pp. http://www.nationalwind.org/pdf/IMPACTOFWINDENERGYANDRELATEDHUMANACTIVITIESONGRASSLANDANDSHRUB-STEPPEBIRDS.pdf

Marshall, D.B., M.W. Chilcote, and H. Weeks. 1996. Species at risk: sensitive, threatened and endangered vertebrates of Oregon. 2nd edition. Oregon Department of Fish and Wildlife, Portland, Oregon.

Millsap, B.A. and G.T. Allen. 2006. Effects of falconry harvest on wild raptor populations in the United States: Theoretical considerations and management recommendations. Wildlife Society Bulletin 34:1392-1400.

NWC and WEST, 2007. Avian and bat monitoring report for the Klondike II Wind Power Project, Sherman County, Oregon. Unpubl. report prepared by Northwest Wildlife Consultants and WEST, Inc. for PPM Energy, Portland, OR.

Orloff, S. and A. Flannery. 1992. Wind Turbine Effects on Avian Activity, Habitat Use, and Mortality in Altamont Pass and Solano County Wind Resource Areas, 1989-1991. Final Report P700-92-001 to Alameda, Contra Costa, and Solano Counties, and the California Energy Commission, Sacramento, California, by Biosystems Analysis, Inc., Tiburon, California. March 1992.

Osborn, R.G., C.D. Dieter, K.F. Higgins, and R.E. Usgaard. 1998. Bird flight characteristics near wind turbines in Minnesota. Am. Midl. Nat. 139:29-38.

Quigley, T.M.; Arbelbeide, S.J., tech. eds. 1997. An assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins: Vol 2. Gen. Tech. Rep. PNWGTR-405. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Vol 1-4. (Quigley, Thomas M., tech. ed.; The Interior Columbia Basin Ecosystem Management Project: Scientific Assessment).

Sauer, J. R., J. E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966 - 2007. Version 5.15.2008. USGS Patuxent Wildlife Research Center, Laurel, MD.

Schmutz, J.K. and R.W. Fyfe. 1987. Migration and mortality of Alberta ferruginous hawks. Condor 89:169-174.

Schmutz, J.K., D.T.T. Flockhart, C.S. Houston, and P.D. McLoughlin. 2008. Demography of ferruginous hawks breeding in western Canada. Journal of Wildlife Management 72:1352-1359.

Schmutz, J.K., P.D. McLoughlin, and C.S. Houston. 2006. Demography of Swainson's hawks breeding in western Canada. Journal of Wildlife Management 70:1455-1460.

Shaffer, J.A. and D.H. Johnson. 2008. Displacement Effects of Wind Developments on Grassland Birds in the Northern Great Plains. Presented at the Wind Wildlife Research Meeting VII, Milwaukee, Wisconsin. Wind Wildlife Research Meeting VII Plenary. October 28-29, 2008. http://www.nationalwind.org/pdf/ShafferJill.pdf

Shump, Jr., K.A. and A.U. Shump. 1982. Hoary bat, *Lasiurus cinereus*. Mammalian Species 185:1-5.

Smallwood, K.S. and C.G. Thelander. 2004. Bird Mortality at the Altamont Pass Wind Resource Area: March 1998 - September 2001. Final report to the National Renewable Energy Laboratory (NREL), Golden, Colorado, Subcontract No. TAT-8-18209-01 with BioResource Consultants, Ojai, California. In review.

Thogmartin, W.E, F.P. Howe, F.C. James, D.H. Johnson, E.T. Reed, J.R. Sauer, and F.R. Thompson, III. 2006. A review of the population estimation approach of the North American Landbird Conservation Plan. The Auk 123:892-904.

Thorson, T.D., Bryce, S.A., Lammers, D.A., Woods, A.J., Omernik, J.M., Kagan, J., Pater, D.E., and Comstock, J.A., 2003. Ecoregions of Oregon (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

Usgaard, R.E., D.E. Naugle, R.G. Osborn, and K.F. Higgins. 1997. Effects of wind turbines on nesting raptors at Buffalo Ridge in southwestern Minnesota. Proceedings of the South Dakota Academy of Science 76: 113-117.

U.S. NABCI Committee. 2000. North American Bird Conservation Initiative: Bird Conservation Region Descriptions. A Supplement to the North American Bird Conservation Initiative Bird Conservation Regions Map. U.S. Fish and Wildlife Service, Arlington, VA.

Walker, J., S.E. Stephens, N.D. Niemuth, C.R. Loesch, R.E. Reynolds, J.S. Gleason, and M.A. Erickson. 2008. Assessing Potential Impacts of Wind Energy Development on Abundance of Breeding Duck Pairs in the Prairie Pothole Region of North and South Dakota. Unpublished report, Ducks Unlimited, Bismarck, North Dakota.

Watson, J.W. 2003. Migration and winter ranges of ferruginous hawks from Washington. Final Report. Washington Department of Fish and Wildlife, Olympia, Washington, USA.

Welty, J.C. 1982. The Life of Birds, 3rd Edition. Saunders College Publishing, Philadelphia.

Wiggins, D. A., D. W. Holt and S. M. Leasure. 2006. Short-eared Owl (Asio flammeus), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/062doi:10.2173/bna.62.

Woofinden, N.D. and J.R. Murphy. 1989. Decline of a ferruginous hawk population: A 20-year summary. Journal of Wildlife Management 53:1127-1132.

Young, Jr., D.P. and W. P. Erickson. 2006. Wildlife Issue Solutions: What Have Marine Radar Surveys Taught Us About Avian Risk Assessment? Proceedings of the American Wind Energy Association Windpower 2006 Conference and Exhibition, Pittsburgh, Pennsylvania, June 4-7, 2006.

Young, Jr., D.P., J.D. Jeffrey, W.P. Erickson, K. Bay, K. Kronner, B Gritski, and J. Baker. 2005a. Combine Hills Turbine Ranch Wildlife Monitoring First Annual Report, March 2004-March 2005. Technical report prepared for Eurus Energy America Corporation, Umatilla County, and the Combine Hills Technical Advisory Committee.

Young, D.P. Jr., W.P. Erickson, and J.P. Eddy. 2005b. Mountain Plover (*Charadrius montanus*) Surveys, Foote Creek Rim Wind Plant, Carbon County, Wyoming, 1995-2005. Unpublished report prepared for PacifiCorp and SeaWest Windpower, Inc. by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming.

Young, Jr., D.P., W.P. Erickson, J.D. Jeffrey, and V.K. Poulton. 2007. Puget Sound Energy Hopkins Ridge Wind Project Phase 1 Post-Construction Avian and Bat Monitoring First Annual Report, January - December 2006. Technical report for Puget Sound Energy, Dayton, Washington and Hopkins Ridge Wind Project Technical Advisory Committee, Columbia County, Washington. **W**estern **E**co**S**ystems Technology, Inc. Cheyenne, Wyoming, and Walla Walla, Washington. 25pp.

Table 1. Avian use estimates and avian fatality estimates for existing wind energy projects in the Columbia Plateau Ecoregion[a].

Project	Mean annual avian use (#/20-min survey)		Mean annual mortality (#/MW/year)			
	Raptors	All birds	Raptors	All birds	Nocturnal Migrants	Source
Combine Hills, OR	0.60	6.0	0	2.6	0.27	Young et al. 2005a
Klondike, I OR	0.47	17.5	0	0.9	0.35	Johnson et al. 2003a
Klondike II, OR	0.47	17.5	0.11	3.1	2.11	NWC and WEST, 2007
Klondike III, OR	0.78 [b]	8.18 [b]	0	2.5	0.51	Gritski et al. 2009
Vansycle, OR	0.41	13.1	0	1.0	0.32	Erickson et al. 2000
Stateline, WA/OR	0.41	13.1	0.10	2.4	0.78	Erickson et al. 2004, 2007
Hopkins Ridge, WA	0.64	8.7	0.14	1.2	0.46	Young et al. 2007
Nine Canyon, WA	0.26	9.4	0.05	2.8	0.45	Erickson et al. 2003
Wild Horse, WA	0.40	5.0	0.09	1.6	0.88	Erickson et al. 2008
Bighorn I, WA	0.90	16.6	0.15	2.6	0.57	Kronner et al. 2008
Leaning Juniper, OR	0.52	23.6	0.21	6.7	1.56	Gritski et al. 2008
Condon, OR	0.37	5.8	0.02[c]	0.05[c]	NR	Fishman Ecological Services 2003
Mean	**0.52**	**12.0**	**0.077**	**2.5**	**0.75**	

[a] Quantitative fatality estimates are not yet available for the Goodnoe and White Creek wind energy facilities in Klickitat County, Washington and the Pebble and Hay Canyon wind energy facilities in Oregon

[b] Surveys were 10 minutes long; estimates provided were multiplied by 2 to estimate use during a 20-minute interval

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

Table 2. Avian use estimates (# observed per 20 minutes per plot with 800-m radius viewshed) for Wind Resource Areas in the Columbia Plateau Ecoregion.

		Mean avian use	
Wind Resource Area	**Location**	**Raptors**	**All birds**
Hopkins Ridge	Columbia Co., WA	0.64	8.7
Nine Canyon	Benton Co., WA	0.26	9.4
Desert Claim	Kittitas Co., WA	0.77	15.3
Kittitas Valley	Kittitas Co., WA	0.90	12
Wild Horse	Kittitas Co., WA	0.40	5
Big Horn I	Klickitat Co., WA	0.90	16.6
White Creek	Klickitat Co., WA	0.66	11.9
Linden Ranch	Klickitat Co., WA	1.64	11.1
Hoctor Ridge	Klickitat Co., WA	1.38	15.3
Imrie	Klickitat Co., WA	0.70	19.2
Windy Point	Klickitat Co., WA	0.77	16.0
Windy Flats	Klickitat Co., WA	0.83	19.9
Reardan	Lincoln Co., WA	0.90	13
Zintel Canyon	Benton Co., WA	0.44	19
Maiden	Benton/Yakima Co., WA	0.38	11.6
Combine Hills	Umatilla Co., OR	0.60	6
Klondike	Sherman Co., OR	0.47	17.5
Biglow	Sherman Co., OR	0.30	9.1
Vansycle	Umatilla Co., OR	0.41	13.1
Elkhorn	Union Co., OR	1.05	21.7
Shepherd's Ridge	Morrow Co., OR	0.61	6.5
Leaning Juniper	Gilliam Co., OR	0.52	23.6
Condon	Gilliam Co., OR	0.37	5.8
Stateline	Walla Walla Co., WA/Umatilla Co., OR	0.41	13.1
Mean		**0.68**	**13.4**
Range		**0.26 – 1.64**	**5 – 23.6**

Table 3. Number and species composition of bird fatalities found at the existing Columbia Plateau Ecoregion wind energy projects [a].

Species	Number fatalities	% composition
horned lark	249	29.7
golden-crowned kinglet	47	5.6
ring-necked pheasant	45	5.4
gray partridge	36	4.3
unidentified passerine	32	3.8
western meadowlark	27	3.2
European starling	25	3.0
mourning dove	24	2.9
chukar	23	2.7
American kestrel	22	2.6
dark-eyed junco	21	2.5
unidentified bird	20	2.4
white-crowned sparrow	17	2.0
red-tailed hawk	14	1.7
rock pigeon	12	1.4
yellow-rumped warbler	11	1.3
ruby-crowned kinglet	10	1.2
winter wren	10	1.2
American robin	8	1.0
Brewer's sparrow	7	0.8
northern flicker	7	0.8
short-eared owl	7	0.8
common nighthawk	6	0.7
house wren	6	0.7
Swainson's hawk	6	0.7
Townsend's warbler	6	0.7
unidentified sparrow	6	0.7
unidentified kinglet	6	0.7
black-billed magpie	5	0.6
red-breasted nuthatch	5	0.6
golden-crowned sparrow	5	0.6
spotted towhee	4	0.5
Canada goose	4	0.5
ferruginous hawk	4	0.5
common raven	3	0.2
rough-legged hawk	3	0.4
song sparrow	3	0.4
vesper sparrow	3	0.4
white-throated swift	3	0.4
acorn woodpecker	2	0.2

American coot	2	0.2
Cassin's vireo	2	0.2
chipping sparrow	2	0.2
great blue heron	2	0.2
great horned owl	2	0.2
house finch	2	0.2
long-eared owl	2	0.2
Macgillivray's warbler	2	0.2
mallard	2	0.2
mountain bluebird	2	0.2
northern harrier	2	0.2
northern rough-winged swallow	2	0.2
pine siskin	2	0.2
sage thrasher	2	0.2
savannah sparrow	2	0.2
unidentified buteo	2	0.2
unidentified warbler	2	0.2
Vaux's swift	2	0.2
western tanager	2	0.2
American goldfinch	1	0.1
American pipit	1	0.1
Barn owl	1	0.1
black-throated sparrow	1	0.1
brown-headed cowbird	1	0.1
bufflehead	1	0.1
California quail	1	0.1
Cooper's hawk	1	0.1
downy woodpecker	1	0.1
golden eagle	1	0.1
grasshopper sparrow	1	0.1
gray catbird	1	0.1
hairy woodpecker	1	0.1
horned grebe	1	0.1
house sparrow	1	0.1
killdeer	1	0.1
Lewis's woodpecker	1	0.1
long-billed curlew	1	0.1
northern pintail	1	0.1
orange-crowned warbler	1	0.1
red-winged blackbird	1	0.1
sage sparrow	1	0.1
sharp-shinned hawk	1	0.1
Swainson's thrush	1	0.1
Townsend's solitaire	1	0.1
tree swallow	1	0.1

turkey vulture	1	0.1
unidentified accipiter	1	0.1
unidentified duck	1	0.1
unidentified empidonax	1	0.1
unidentified gamebird	1	0.1
unidentified nuthatch	1	0.1
unidentified owl	1	0.1
unidentified thrush	1	0.1
unidentified vireo	1	0.1
unidentified woodpecker	1	0.1
varied thrush	1	0.1
Virginia rail	1	0.1
warbling vireo	1	0.1
western grebe	1	0.1
western kingbird	1	0.1
western wood-pewee	1	0.1
Williamson's sapsucker	1	0.1
Wilson's warbler	1	0.1
yellow warbler	1	0.1
Total	837	100

[a] Species composition of bird fatalities is based on the data provided in those studies included in Table 1 as well as raw fatality data (species and numbers) for the Goodnoe and White Creek wind energy facilities in Klickitat County, Washington and the Pebble and Hay Canyon wind energy facilities in Oregon

Table 4. Percent composition of avian fatalities by species group for existing Columbia Plateau Ecoregion wind energy projects.

Species	Number of Fatalities	Percent Composition
Passerines	562	67.1
Upland gamebirds	106	12.6
Raptors	70	8.5
Doves/pigeons	36	4.3
Waterbirds/waterfowl/shorebirds	18	2.1
Other birds[a]	25	3.0
Unidentified birds	20	2.4
Totals	**837**	**100**

[a] woodpeckers, nighthawks, swifts

Table 5. Summary of bat mortality at existing wind energy projects in the Columbia Plateau Ecoregion.

Project Name [state]	Bats per MW[a]	Reference
Stateline [OR/WA]	1.44	Erickson et al. 2004, 2007
Vansycle [OR]	1.12	Erickson et al. 2000
Klondike [OR]	0.77	Johnson et al. 2003b
Klondike II [OR]	0.41	NWC and WEST, Inc. 2007
Klondike III [OR]	0.23	Gritski et al. 2009
Hopkins Ridge [WA]	0.63	Young et al 2007
Wild Horse [WA]	0.39	Erickson et al. 2008
Nine Canyon [WA]	2.46	Erickson et al. 2003
Leaning Juniper [OR]	1.98	Gritski et al. 2008
Big Horn I [WA]	1.90	Kronner et al. 2008
Combine Hills [OR]	1.88	Young et al. 2005a
Average	**1.20**	

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

Table 6. Number and species composition of bat fatalities found at eight existing Columbia Plateau wind energy projects[a].

Species	Number of Fatalities	Percent Composition
silver-haired bat	184	47.2
hoary bat	180	46.2
unidentified bat	13	3.3
little brown bat	8	2.1
big brown bat	5	1.3
Totals (4 species)	**390**	**100**

[a] Species composition of bat fatalities is based on the data provided in those studies included in Table 5 as well as raw fatality data (species and numbers) for the Goodnoe and White Creek wind energy facilities in Klickitat County, Washington and the Pebble and Hay Canyon wind energy facilities in Oregon

Table 7. Seasonal timing of raptor fatalities at existing wind energy facilities in the Columbia Plateau.

Wind Energy Project	Season				
	Spring	Summer	Fall	Winter	Overall
Combine Hills, OR	0	0	0	0	0
Klondike I, OR	0	0	0	0	0
Klondike II, OR	0	1	1	0	2
Klondike III, OR	0	0	0	0	0
Vansycle, OR	0	0	0	0	0
Stateline, WA/OR	3	8	6	1	18
Hopkins Ridge, WA	1	3	1	1	6
Nine Canyon, WA	1	0	0	0	1
Wild Horse, WA	1	5	0	0	6
Bighorn I, WA	4	5	2	5	16
Leaning Juniper, OR	4	3	4	0	11
Condon, OR	1	0	0	0	1
Totals	**15**	**28**	**14**	**7**	**65**
Percent	**23.1**	**43.1**	**21.5**	**10.8**	**100**

Table 8. Comparison of avian and bat fatality estimates presented in this report between 6700 and 5577 megawatts of wind energy development in the Columbia Plateau ecoregion.

Fatality estimates by avian or bat species/group	MW of installed Capacity	
	5577	6700
All birds	13,942	16,750
All raptors	430	516
American kestrel	135	162
Red-tailed hawk	86	103
Short-eared owl	43	52
Ferruginous hawk	24	29
Swainson's hawk	37	44
Golden eagle	6	7
Upland gamebirds	1756	2110
Waterfowl/waterbirds/shorebirds	293	352
Passerines	9351	11,239
Horned lark	4139	4975
Western meadowlark	449	540
Nocturnal migrants	4181	5025
Golden-crowned kinglet	780	938
Long-billed curlew	17	20
Lewis's woodpecker	17	20
Grasshopper sparrow	17	20
Sage thrasher	17	20
Sage sparrow	17	20
Vaux's swift	17	20
All bats	6689	8040
Silver-haired bat	3157	3795
Hoary bat	3090	3714

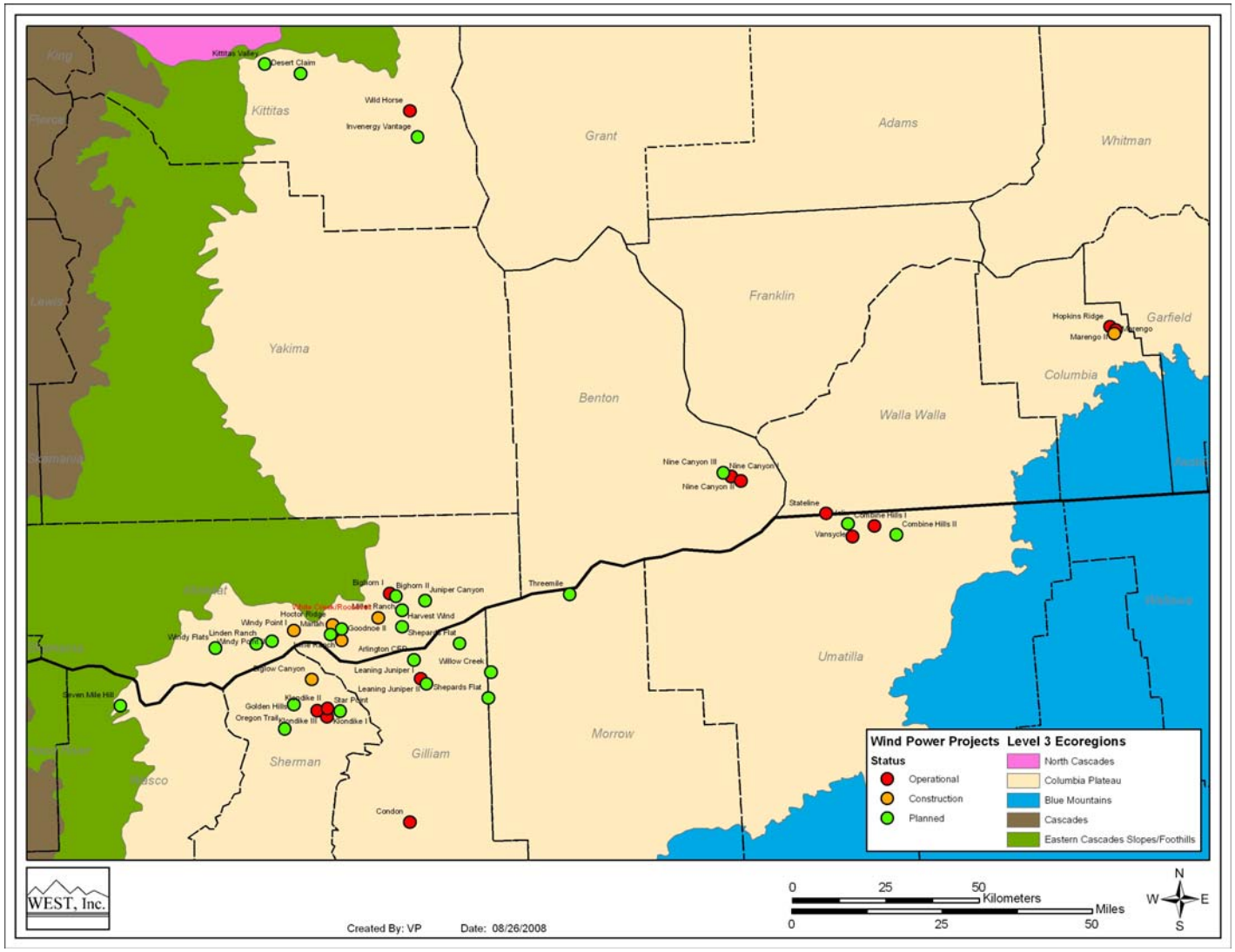


Figure 1. Location of existing and proposed wind energy facilities in the Columbia Plateau Ecoregion of southeastern Washington and northeastern Oregon, October 2008.

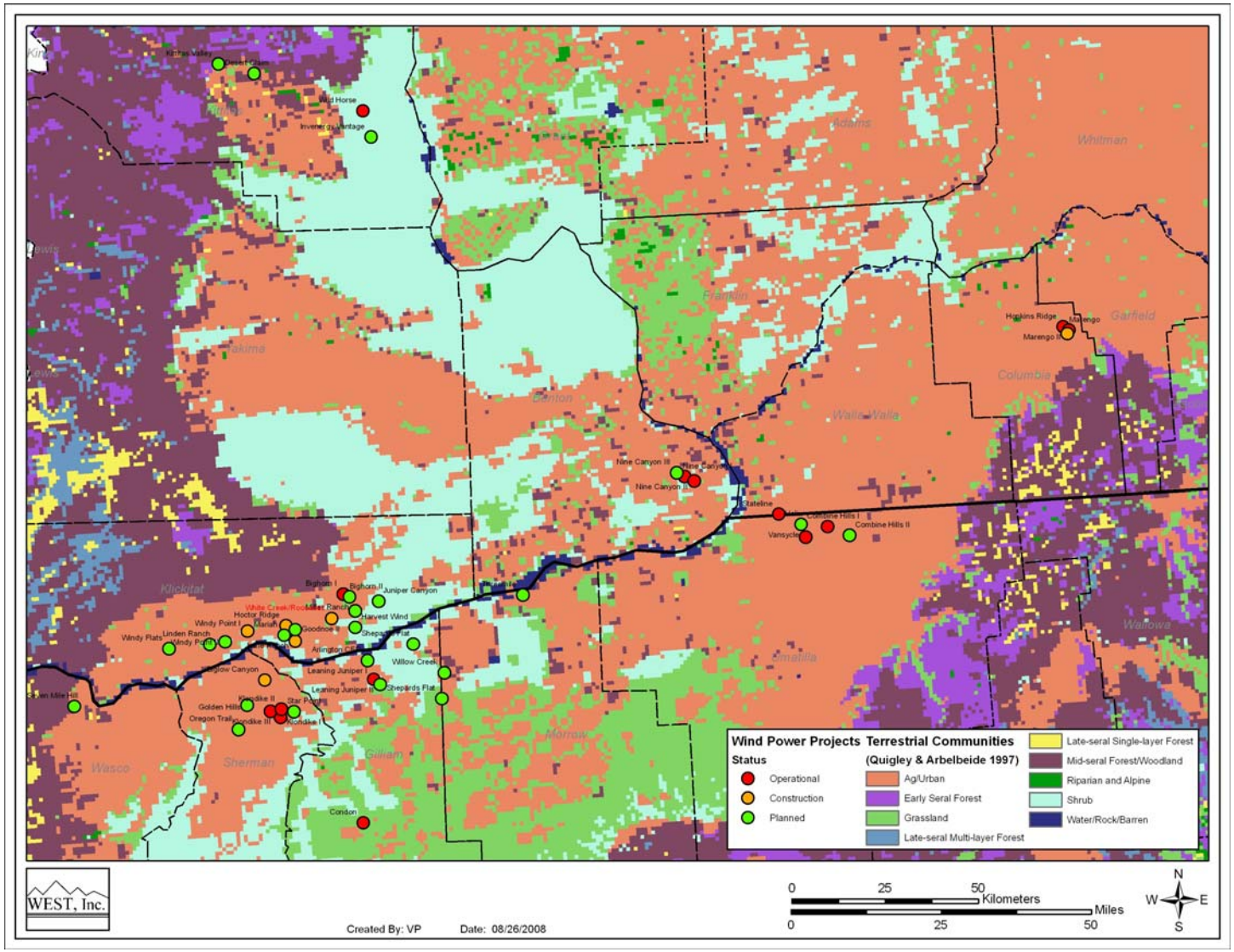


Figure 2. Terrestrial vegetative communities within the Columbia Plateau Ecoregion.

ATTACHMENT P-6

Revised Draft Habitat Plans

Revised Draft Revegetation Plan
Revised Draft Wildlife Mitigation and Monitoring Plan
Revised Draft Habitat Mitigation Plan

Montague Wind Project: Revegetation Plan

[MARCH XX, 2010]

I. Introduction

This plan describes methods and standards for restoration of areas disturbed during the construction of the Montague Wind Power Facility (MWF), excluding areas occupied by permanent facility components (the "footprint").[1] The objective of revegetation is to restore the disturbed areas to pre-disturbance condition or better. The site certificate for the facility requires restoration of these areas. This plan has been developed in consultation with the Oregon Department of Fish and Wildlife (ODFW).

The site certificate describes the area of disturbance anticipated during construction of the MWF. The affected area includes cultivated or otherwise developed agricultural land (cropland) as well as areas of grassland, shrub-steppe habitat and other habitat subtypes (wildlife habitat areas). The intensity of the construction impact will vary. In some areas, the impact will be relatively light, but in other areas, heavy construction activity will remove all vegetation, remove topsoil and compact the remaining subsoil. Where vegetation has been damaged or removed during construction, the certificate holder must restore suitable vegetation. In addition, the certificate holder shall maintain erosion and sediment control measures put in place during construction until the affected areas are restored as described in this plan and the risk of erosion has been eliminated. The plan specifies monitoring procedures to evaluate revegetation success of disturbed wildlife habitat areas. Remedial action may be necessary for wildlife habitat areas that do not show revegetation progress. Additional mitigation may be necessary if revegetation is unsuccessful.

II. Description of the Facility Site

The facility is located in Gilliam County, Oregon. The facility site is on private agricultural land used primarily for wheat and hay farming, livestock grazing and some land in the Conservation Reserve Program. The majority of the facility components are located on four primary soil types: the Olex Unit, the Ritzville Unit, the Warden Unit, and the Willis Unit. Soils are typically well-drained, moderately permeable, fertile silt loams formed in loess deposits. The area receives between approximately 9 and 14 inches of precipitation annually, most of which occurs between October 1 and March 31.

The site is within the Columbia Plateau physiographic province. The facility is located on an upland plateau at elevations ranging from approximately 530 feet to 1520 feet. Most of the native vegetation within the site boundary has been modified by historic and ongoing livestock grazing and past wildfires.

The general land cover types are Developed, Exposed Rock, Grassland, Shrub-steppe, and Woodland. No new unique habitat types are present in the anticipated development areas within the site boundary that have not already been studied for adjacent Leaning Juniper II Facility. The Montague site boundary does contain irrigated agricultural lands (alfalfa and other irrigated

[1] This plan is incorporated by reference in the site certificate for the Montague Wind Power Facility 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.

crops) that are not present in other nearby studied sites. However, these fields are in the lower elevations along drainage bottoms such as Eightmile Canyon, not on higher elevation sites where turbines are typically placed. The Juniper Woodland habitat type is more extensive in some portions of the facility site boundary (found along Eightmile and Fourmile Canyons) than at other nearby studied sites where wildfires and land use have altered vegetation structure and functionality for wildlife. However, like the irrigated agricultural lands, these habitats are generally found at lower elevations and the turbines are typically placed along the ridge tops.

Specifically, functional, mature sagebrush (big sage) shrub-steppe and juniper woodland habitat is patchy, occurring in specific locations within the site boundary. Sagebrush (big sage) shrub-steppe is found on deep soils in patches throughout the site boundary and higher quality habitat is usually found on slopes or in draws that have been avoided for agricultural development. Juniper woodland habitat is present in the north, middle, and southern portions of the site boundary, but individual juniper trees are scattered sparsely in other habitats. Recent wildfires have removed some juniper trees in the Eightmile Canyon area. Riparian woodland habitat within the site boundary is limited to one narrow intermittent linear course in Eightmile canyon. Rabbitbrush/Snakeweed shrub-steppe habitat is the most prevalent native habitat type within the Montague site boundary. Rabbitbrush/Snakeweed shrub-steppe is more prevalent in the north, west, and middle portions of the site boundary, with smaller patches distributed throughout much of the site boundary. Native perennial grassland is also present throughout much of the north, middle, and south portions of the site boundary..

III. Revegetation Methods

The certificate holder shall begin restoration of disturbed areas as soon as possible after completion of facility construction activity in the area to be restored. The certificate holder shall restore areas of disturbance by preparing the soil and seeding using common application methods. The certificate holder shall use mulching and other appropriate practices to control erosion and sediment during facility construction and during revegetation work. The certificate holder shall restore topsoil to pre-construction condition. The certificate holder shall select the seed mix to apply based on the pre-construction land use, as described below. For affected juniper woodland areas, planting young juniper trees may be preferred over seeds. The certificate holder shall consult with ODFW as described in Section V below regarding appropriate seeding or planting according to site-specific restoration needs.

1. Seed Planting Methods

Planting should be done at the appropriate time of year to facilitate seed germination, based on weather conditions and the time of year when construction-related ground disturbance occurs. The certificate holder shall choose planting methods based on site-specific factors such as slope, erosion potential and the size of the area in need of revegetation. Disturbed ground may require chemical or mechanical weed control before weeds have a chance to go to seed. Two common application methods are described as follows.

(a) Broadcasting

Broadcast the seed mix at the specified application rate. Where feasible, apply half of the total mix in one direction and the second half of mix in the direction perpendicular to first half. Apply weed-free straw from a certified field or sterile straw at a rate of two tons per acre immediately after applying seed. Crimp straw into the ground to a depth of two inches using a

crimping disc or similar device. As an alternative to crimping, a tackifier may be applied using hydroseed equipment at a rate of 100 pounds per acre. Prior to mixing the tackifer, visually inspect the tank for cleanliness. If remnants from previous hydroseed applications exist, wash tank to remove remnants. Include a tracking dye with the tackifier to aid uniform application. Broadcasting should not be used if winds exceed five miles per hour.

(b) Drilling

Using an agricultural or range seed drill, drill seed at 70 percent of the recommended application rate to a depth of ¼ inch or as recommended by the seed supplier. Where feasible, apply half of the total mix in one direction and the second half of mix in the direction perpendicular to first half. If mulch has been previously applied, seed may be drilled through the mulch provided the drill is capable of penetrating the straw resulting in seed-to-soil contact conducive for germination.

IV. Restoration of Cropland

The certificate holder shall seed disturbed cropland areas with wheat or other crop seed. The certificate holder 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. The certificate holder 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.

V. Restoration of Wildlife Habitat Areas

The certificate holder shall seed all disturbed grassland, shrub-steppe, juniper woodland and other wildlife habitat subtype areas that are not cropland or other developed lands. The certificate holder shall consult with ODFW and the landowner to determine the appropriate seed mix and application rate for these areas, including a combination of grasses, forbs, shrubs and juniper trees based on the characteristics of the affected area. The mix should contain native species selected based on relative availability and compatibility with local growing conditions. Seed mix selection should consider soil erosion potential, soil type, seed availability and the need for using native or native-like species. The certificate holder shall obtain approval of the composition of the seed mix from the Oregon Department of Energy (Department). The certificate holder shall use seed provided by a reputable supplier and complying with the Oregon Seed Law. The certificate holder shall determine the number and size of the juniper tree plants based on the professional judgment of a qualified biologist after a ground survey of actual conditions. The certificate holder shall obtain young native species trees from a qualified nursery or suitable transplants from MWF construction zones.

VI. Monitoring

1. Revegetation Record

The certificate holder shall maintain a record of revegetation work for both cropland and wildlife habitat areas. In the record, the certificate holder 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-disturbance condition), the date that revegetation work began and a description of the work done within the affected area. The certificate shall update the revegetation records from time to time, as revegetation work occurs. The certificate holder shall provide copies of these records to the Department at the time of submitting the annual report required under the site certificate.

2. Monitoring Procedures

The certificate holder shall monitor the revegetation of wildlife habitat areas as described in this section, unless the landowner has converted the area to a use inconsistent with the success criteria. The certificate holder shall employ a qualified investigator (an independent botanist or revegetation specialist) to examine all non-cropland revegetation areas to assess vegetation cover (species, structural stage, etc.) and progress toward meeting the success criteria described below.

Weed Control

A qualified investigator shall inspect each revegetation area on an annual basis during the first five years following initial seeding to assess weed growth and to recommend weed control measures. The investigator shall report to the certificate holder, the Department and ODFW following each inspection, describing weed growth and the success of control measures. Based on the Year 5 report (described below), the certificate holder shall confer with the Department and ODFW to develop a weed control plan for subsequent years.

Wildlife Habitat Recovery

After the first growing season following initial seeding/juniper planting (Year 1), a qualified investigator shall inspect each revegetation area to assess revegetation success based on the success criteria and to recommend remedial actions, if needed. The qualified investigator shall reinspect these areas at two years and at four years after the first inspection (Year 3 and Year 5). The investigator shall report to the certificate holder, the Department and ODFW following each inspection. The report shall include the investigator's assessment of whether the revegetated areas are trending toward meeting the success criteria and any remedial actions recommended.

Based on the Year 5 report, the certificate holder shall confer with the Department and ODFW to develop an action plan for subsequent years. If an area is not trending toward meeting the success criteria at Year 5 and has not been converted by the landowner to an inconsistent use, the certificate holder may propose remedial action and additional monitoring based on an evaluation of site capability. As an alternative, the certificate holder may conclude that revegetation of the area was unsuccessful and propose appropriate mitigation for the loss of habitat quality and quantity. The certificate holder shall implement the action plan, subject to the approval of the Department.

The certificate holder's qualified investigator shall evaluate whether a wildlife habitat area is trending toward meeting the success criteria by comparing the revegetation area to a reference area. In consultation with ODFW, the investigator shall choose reference sites near the revegetation area to represent the target conditions for the revegetation effort. The investigator shall select one or more reference sites that closely resemble the pre-disturbance characteristics of the revegetation area as indicated by site conditions, including vegetation density, relative proportion of desirable vegetation and species diversity of desirable vegetation. "Desirable vegetation" means those species included in the seed mix or native or native-like species,

excluding noxious weeds. The investigator shall consider land use patterns, soil type, local terrain and noxious weed densities in selecting reference sites. It is likely that different reference sites will be needed to represent different pre-disturbance habitat conditions of the disturbed areas.

During the monitoring visits in Year 1, Year 3 and Year 5, the certificate holder's qualified investigator shall compare the revegetation area to the selected reference sites, unless some event (such as wildfire, tilling, or intensive livestock grazing) has changed the vegetation conditions of a reference site so that it no longer represents the pre-disturbance conditions of the revegetation area. If such events have eliminated all suitable reference sites for a revegetation area, the investigator, in consultation with ODFW, shall select one or more new reference sites.

Within each revegetation area, the investigator shall evaluate the progress of wildlife habitat recovery in comparison to the reference sites. The investigator shall evaluate the following site conditions (both within the revegetation area and within the reference sites):

- Degree of erosion due to disturbance activities (high, moderate or low).
- Vegetation density.
- Relative proportion of desirable vegetation as determined by the average number of stems of desirable vegetation per square foot or by a visual scan of the area, noting overall recovery status.
- Number of surviving juniper trees and overall vigor, height of tree and the extent of branching.
- Species diversity of desirable vegetation.

The certificate holder shall report the investigator's findings and recommendations regarding wildlife habitat recovery and revegetation success on an annual basis to the Department (as part of the annual report on the facility) and to ODFW.

3. Success Criteria

In each monitoring report to the Department, the certificate holder shall provide an assessment of revegetation success for all previously-disturbed wildlife habitat areas. A wildlife habitat area is successfully revegetated when its habitat quality is equal to, or better than, the habitat quality of the reference site as measured by the site conditions listed above. Juniper planting will be considered successful when, in the investigator's judgment, one in five have survived.

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 its restoration obligations for that area. If the Department finds that the landowner has converted a wildlife habitat 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.

4. Remedial Action

After each monitoring visit, the certificate holder's qualified investigator shall report to the certificate holder regarding the revegetation progress of each wildlife habitat area. The

investigator shall make recommendations to the certificate holder for reseeding or other remedial measures for areas that are not showing progress toward achieving revegetation success. The certificate holder shall take appropriate action to meet the objectives of this revegetation plan. On an annual basis as part of the annual report on the facility, the certificate holder shall report to the Department the investigator's recommendations and the remedial actions taken. The Department may require reseeding or other remedial measures in those areas that do not meet the success criteria.

If a wildlife habitat area is damaged by wildfire during the first five years following initial seeding, the certificate holder shall work with the landowner to restore the damaged area. The certificate holder shall continue to report on revegetation progress during the remainder of the five-year period. The certificate holder shall report the damage caused by wildfire and the cause of the fire, if known.

VII. Amendment of the Plan

This Revegetation Plan may be amended from time to time by agreement of the certificate holder and the Oregon Energy Facility Siting Council ("Council"). Such amendments may be made without amendment of the site certificate. The Council authorizes the Department to agree to amendments to this plan. The Department 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 Department.

Montague Wind Power Facility: Wildlife Monitoring and Mitigation Plan

[DATE]

This plan describes wildlife monitoring that the certificate holder shall conduct during operation of the Montague Wind Power Facility (MWPF).[1] The monitoring objectives are to determine whether the facility causes significant fatalities of birds and bats and to determine whether the facility results in a loss of habitat quality.

The certificate holder shall use experienced and properly trained personnel (the "investigators") to conduct the monitoring required under this plan. The professional qualifications of the investigators are subject to approval by the Oregon Department of Energy (Department). For all components of this plan except the Wildlife Reporting and Handling System, the certificate holder shall hire independent third party investigators (not employees of the certificate holder) to perform monitoring tasks.

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

1) Fatality monitoring program including:
    a) Removal trials
    b) Searcher efficiency trials
    c) Fatality search protocol
    d) Statistical analysis
2) Raptor nesting surveys
3) Washington ground squirrel surveys
4) Wildlife Reporting and Handling System

Based on the results of the monitoring programs, mitigation of significant impacts may be required. The selection of the mitigation actions 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. Fatality Monitoring

(a) Definitions and Methods

Seasons

This plan uses the following dates for defining seasons:

[1] This plan is incorporated by reference in the site certificate for the MWPF 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.

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), shall select search plots based on a systematic sampling design that ensures that the selected search plots are representative of the habitat conditions 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 before beginning fatality monitoring at the facility. The certificate holder shall use the same search plots for each search conducted during a monitoring year.

Scheduling

Fatality monitoring will begin one month after commencement of commercial operation of the facility. Subsequent monitoring years will follow the same schedule (beginning in the same calendar month in the subsequent monitoring 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, 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)

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 each monitoring year in search plots at one-third of the turbines that are built or 50 turbines, whichever is greater.If fewer than 50 turbines are built, the certificate holder shall search all turbines.

As described in the site certificate, the certificate holder may choose to build the MWPF using turbine types in two size classes:

- Small: turbines having a rotor diameter of 82 meters or less
- Large: turbines having a rotor diameter greater than 82 meters

If the final design of the MWPF includes both small and large turbines, the certificate holder shall consult with an independent expert with experience in statistical analysis of avian

fatality data to determine whether it would be possible to design a turbine sample with a sufficient number of turbines in each size class to allow a statistical comparison of fatality rates for all birds as a group. The certificate holder shall submit the expert's written analysis to the Department. If the expert's analysis shows that a comparison study is possible and if the Department approves, the certificate holder shall sample the appropriate number of turbines in each class and conduct the comparison study. The certificate holder may choose to sample more than 50 turbines in each monitoring year, if a larger sample size would allow the comparison study to be done.

Duration of Fatality Monitoring

The certificate holder shall perform one complete monitoring cycle during the first full year of facility operation (Year 1). At the end of the first year of monitoring, the certificate holder will report the results for joint evaluation by the Department, the certificate holder and Oregon Department of Fish and Wildlife (ODFW). In the evaluation, the certificate holder shall compare the results for the MWPF with the thresholds of concern described in Section 1(g) of this plan and with comparable data from other wind power facilities in the Columbia Basin, as available. If the fatality rates for the first year of monitoring at the MWPF do not exceed any of the thresholds of concern and are within the range of the fatality rates found at other wind power facilities in the region, then the certificate holder will perform its second year of monitoring in Year 5 of operations.

If fatality rates for the first year of monitoring at the MWPF exceed any of the thresholds of concern or exceed the range of fatality rates found at other wind power facilities in the region, the certificate holder shall propose additional mitigation for Department and ODFW review within 6 months after reporting the fatality rates to the Department. Alternatively, the certificate holder may opt to perform a second year of fatality monitoring immediately if the certificate holder believes that the results of Year 1 monitoring were anomalous. If the certificate holder takes this option, the certificate holder still must perform the monitoring in Year 5 of operations as described above.

(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. 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.

The investigators shall conduct carcass removal trials within each of the seasons defined above during the first year of fatality monitoring. For each trial, the investigators shall use 10 to 15 carcasses of small- and large-bodied species. Trial carcasses shall be placed at least 1,000 feet from any search plots and distributed proportionately within habitat categories and subtypes similar to the search plots.

Subject to the approval of the Department, the investigators may reduce the number of removal trials and the number of trial carcasses during any subsequent year of fatality monitoring based on a comparison of the removal data from the first year at the MWPF to published removal data from nearby wind energy facilities.

The investigators shall use game birds or other legal sources of avian species as test carcasses for the removal trials, and the investigators may use carcasses found in fatality

monitoring searches. The investigators shall select species with the same coloration and size attributes as species found within the site boundary. 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.

Trial carcasses will be marked discreetly for recognition by searchers and other personnel. 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) or (3) partially hidden. The planted carcasses will be located randomly within the carcass removal trial plots.. Trial carcasses will be left at the location until the end of the carcass removal trial.

An approximate schedule for assessing removal status is once daily for the first 4 days, and on days 7, 10, 14, 21, 28 and 35. This schedule may be adjusted depending on actual carcass removal rates, weather conditions and coordination with the other survey work. The condition of scavenged carcasses will be documented during each assessment, and at the end of the trial all traces of the carcasses will be removed from the site. Scavenger or other activity could result in complete removal of all traces of a carcass in a location or distribution of feathers and carcass parts to several locations. This distribution will not constitute removal if evidence of the carcass remains within an area similar in size to a search plot and if the evidence would be discernable to a searcher during a normal survey.

Before beginning removal trials for any subsequent year of fatality monitoring, the certificate holder shall report the results of the first year removal trials to the Department and ODFW. In the report, the certificate holder shall analyze whether four removal trials per year, as described above, provides sufficient data to accurately estimate adjustment factors for carcass removal. The number of removal trials may be adjusted up or down, subject to the approval of the Department.

(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 investigators shall conduct searcher efficiency trials on the fatality monitoring search plots in both grassland/shrub-steppe and cultivated agriculture habitat types. A pooled estimate of searcher efficiency will be used to adjust carcass counts for detection bias.

The investigators shall conduct searcher efficiency trials within each of the seasons defined above during the years in which the fatality monitoring occurs. Each trial will involve approximately 4 to 15 carcasses. The searchers will not be notified of carcass placement or test dates. The investigators shall vary the number of trials per season and the number of carcasses per trial so that the searchers will not know the total number of trial carcasses being used in any trial. In total, approximately 80 carcasses will be used per year, or approximately 15 to 25 per season.

For each trial, the investigators shall use small- and large-bodied species. The investigators shall use game birds or other legal sources of avian species as test carcasses for the efficiency trials, and the investigators may use carcasses found in fatality monitoring searches. The investigators shall select species with the same coloration and size attributes as species found within the site boundary. If suitable test 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. The investigators shall mark the test carcasses to differentiate them from other carcasses that might be found within the search plot and shall use methods similar to those used to mark removal test carcasses as long as the procedure is sufficiently discreet and does not increase carcass visibility.

The certificate holder shall distribute trial carcasses in varied habitat in rough proportion to the habitat types within the facility site. On the day of a standardized fatality monitoring search (described below) but before the beginning of the search, investigators will place efficiency trial carcasses randomly within search plots (one to three trial carcasses per search plot) within areas to be searched. If scavengers appear attracted by placement of carcasses, the carcasses will be distributed before dawn.

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 or 3) partially hidden.

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. Following plot searches, all traces of test carcasses will be removed from the site.

If new searchers are brought into the search team, additional searcher efficiency trials will be conducted to ensure that detection rates incorporate searcher differences. The certificate holder shall include a discussion of any changes in search personnel and any additional detection trials in the reporting required under Section 5 of this plan.

Before beginning searcher efficiency trials for any subsequent year of fatality monitoring, the certificate holder shall report the results of the first year efficiency trials to the Department and ODFW. In the report, the certificate holder shall analyze whether the efficiency trials as described above provided sufficient data to accurately estimate adjustment factors for searcher efficiency. The number of searcher efficiency trials for any subsequent year of fatality monitoring may be adjusted up or down, subject to the approval of the Department.

(d) Fatality Monitoring Search Protocol

The objective fatality monitoring is to estimate the number of bird and bat fatalities that are attributable to facility operation as an indicator of the impact of the facility on habitat quality. The goal of bird and bat fatality monitoring is to estimate fatality rates and associated variances. The certificate holder shall conduct fatality monitoring using standardized carcass searches according to the schedule described above.

Personnel trained in proper search techniques (“the searchers”) will conduct the carcass searches by walking parallel transects approximately 20 feet (6 meters) apart within the search plots. A searcher will walk at a rate of approximately 148 to 197 feet (45 to 60 meters) per minute along each transect, searching both sides out to 10 feet (3 meters) for casualties. Search area and speed may be adjusted by habitat type after evaluation of the first searcher efficiency trial.

Searchers shall flag all avian or bat carcasses discovered. Carcasses are defined as a complete carcass or body part, 10 or more feathers or three or more primary feathers in one location. When parts of carcasses and feathers from the same species are found within a search plot, searchers shall make note of the relative positions and assess whether or not these are from the same fatality.

All carcasses (avian and bat) found during the standardized carcass searches will be photographed, recorded and labeled with a unique number. Searchers shall make note of the nearest two or three structures (turbine, power pole, fence, building or overhead line) and the approximate distance from the carcass to these structures. The species and age of the carcass will be determined when possible. Searchers shall note the extent to which the carcass is intact and estimate time since death. Searchers shall describe all evidence that might assist in determination of cause of death, such as evidence of electrocution, vehicular strike, wire strike, predation or disease. When assessment of the carcass is complete, all traces of it will be removed from the site.

Each carcass will be bagged and frozen for future reference and possible necropsy or (if the carcass is fresh and whole) for use in trials. 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 photograph each carcass as found and will map the find on a detailed map of the search area showing the location of the wind turbines and associated facilities. 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 investigators shall calculate fatality rates using the statistical methods described in Section (f), except that the investigators may use different notation or methods that are mathematically equivalent with prior approval of the Department. In making these calculations, the investigators may exclude carcass data from the first search of each turbine plot (to eliminate possible counting of carcasses that were present before the turbine was operating).

The investigators 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 fatalities will be estimated by adjusting for removal and searcher efficiency bias.

On an annual basis, the certificate holder shall report an estimate of fatalities in eight categories: (1) all birds, (2) small birds, (3) large birds, (4) raptors, (5) grassland birds, (6) nocturnal migrants, (7) state and federally listed threatened and endangered species and State Sensitive Species listed under OAR 635-100-0040 and (8) bats. The certificate holder shall report annual fatality rates on both a per-MW and per-turbine basis.

(e) Incidental Finds and Injured Birds

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 handling 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 a qualified rehabilitation specialist approved by the Department.[4] The certificate holder shall pay costs, if any, 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]
(2) Searcher efficiency expressed as the proportion of planted carcasses found by searchers.
(3) 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 search plot buffer area)

$\bar{c}$ the average number of carcasses observed per turbine per year

[4] Approved specialists include Lynn Tompkins (wildlife rehabilitator) of Blue Mountain Wildlife, a wildlife rehabilitation center in Pendleton, and the Audubon Bird Care Center in Portland. The certificate holder must obtain Department approval before using other specialists.
[5] If a different cause of death is not apparent, the fatality will be attributed to facility operation.

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 35 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:

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

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 35 days are collected, yielding censored observations at 35 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), habitat type 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, habitat type and season.

Estimation of Facility-Related Fatality Rates

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

$$m_t = \frac{\bar{c}}{\hat{\pi}}, \tag{3}$$

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. Under these assumptions, this detection probability is estimated by:

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

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

$$m = \frac{m_t}{C}. \tag{5}$$

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 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

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.

Mitigation may be appropriate if fatality rates exceed a "threshold of concern."[6] For the purpose of determining whether a threshold has been exceeded, the certificate holder shall calculate the average annual fatality rates for species groups after each year 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 MWPF:

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
Grassland species (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.)	0.2
Bat species as a group	2.5

If the data show that a threshold of concern for a species group has been exceeded, the certificate holder shall implement additional mitigation if the Department determines that mitigation is appropriate based on analysis of the data, consultation with ODFW and consideration of any other significant information available at the time. In addition, the Department may determine that mitigation is appropriate if fatality rates for individual avian or bat species (especially State Sensitive Species) are higher than expected and at a level of biological concern. If the Department determines that mitigation is appropriate, the certificate holder, in consultation with the Department and ODFW, shall propose mitigation measures designed to benefit the affected species. *This may take into consideration whether the mitigation required or provided in conjunction with raptor nest monitoring or habitat mitigation, or other WMMP and HMP plan components, would also benefit the affected species.*

The certificate holder shall implement mitigation as approved by the Department, subject to review 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.

[6] The Council adopted "thresholds of concern" for raptors, grassland species, and state sensitive avian species in the Final Order on the Application for the Klondike III Wind Project (June 30, 2006) and for bats in the Final Order on the Application for the Biglow Canyon Wind Farm (June 30, 2006). As explained in the Klondike III order: "Although the threshold numbers provide a rough measure for deciding whether the Council should be concerned about observed fatality rates, the thresholds have a very limited scientific basis. The exceeding of a threshold, by itself, would not be a scientific indicator that operation of the facility would result in range-wide population level declines of any of the species affected. The thresholds are provided in the Wildlife Monitoring and Mitigation Plan to guide consideration of additional mitigation based on two years of monitoring data."

The certificate holder shall design mitigation 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; improving wildfire response; and conducting or making a contribution to research that will aid in understanding more about the affected species and its conservation needs in the region.

If the data show that the threshold of concern for bat species as a group has been exceeded, the certificate holder shall implement additional mitigation if the Department determines that mitigation is appropriate based on analysis of the data, consultation with ODFW and consideration of any other significant information available at the time. For example, if the threshold for bat species as a group is exceeded, the certificate holder may contribute to Bat Conservation International or to a Pacific Northwest bat conservation group to fund new or ongoing research in the Pacific Northwest to better understand wind facility impacts to bat species and to develop possible ways to reduce impacts to the affected species.

2. Raptor Nest Surveys

The objectives of raptor nest surveys are: (1) to estimate the size of the local breeding populations of raptor species that nest on the ground or aboveground in trees or other aboveground nest locations in the vicinity of the facility; and (2) 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, golden eagle, ferruginous hawk and burrowing owl.

The certificate holder shall conduct short-term and long-term monitoring. The certificate holder's qualified investigators will use aerial and ground surveys to evaluate nest success by gathering data on active nests, on nests with young and on young fledged. The investigators will analyze the data as described in Section 3(c) and will share the data with state and federal biologists.

(a) Short-Term Monitoring

Short-term monitoring will be done in two monitoring seasons. The first monitoring season will be in the first raptor nesting season after completion of construction of the facility. The second monitoring season will be in the fourth year after construction is completed. The certificate holder shall provide a summary of the first-year results in the monitoring report described in Section 5. After the second monitoring season, the investigators will analyze two years of data compared to the baseline data.

For Raptor Species that Nest Aboveground

During each monitoring season, the investigators will conduct a minimum of one aerial and one ground survey for raptor nests in late May or early June and additional surveys as described in this section. The survey area is the area within the facility site and a 2-mile buffer

zone around the site. For the ground surveys while checking nesting *success* (conducted up to a maximum of ½ mile of the facility site), nests outside the leased project boundary will be checked from an appropriate distance where feasible, depending on permission from the landowner for access.

All nests discovered during pre-construction surveys and any nests discovered during post-construction surveys, whether active or inactive, will be given identification numbers. Nest locations will be recorded on U.S. Geological Survey 7.5-minute quadrangle maps. Global positioning system (GPS) coordinates will be recorded for each nest. Locations of inactive nests will be recorded because they could become occupied during future years.

Determining nest *occupancy* may require one or two visits to each nest. Aerial surveys for nest occupancy will be conducted within the facility site and a 2-mile buffer. For occupied nests, the certificate holder will determine nesting *success* by a minimum of one ground visit to determine the species, number of young and young fledged within the facility site and ½ mile. "Nesting success" means that the young have successfully fledged (the young are independent of the core nest site).

For Burrowing Owls

If burrowing owl nest sites are discovered, the investigators will monitor them according to the following protocol. This species is not easily detected during aerial raptor nest surveys. The investigators shall record active burrowing owl nest sites in the vicinity of the facility as they are discovered during other wildlife monitoring tasks. Any nests discovered during post-construction surveys, whether active or showing signs of intermittent use by the species, 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 site. Coordinates for ancillary burrows used by one nesting pair or a group of nesting pairs will also be recorded. Locations of inactive nests will be recorded because they could become occupied during future years.

The investigators shall conduct burrowing owl monitoring in the same years as the raptor nest surveys described above. For occupied nests, the investigators shall determine nesting *success* by a minimum of one ground visit to determine species, number of young and young fledged. "Nesting success" means that the young have successfully fledged (the young may or may not be independent of the core nest site). Three visits to the nest sites may be necessary to determine outcome. Nests that cannot be monitored due to the landowner denying access will be checked from a distance where feasible.

If burrowing owl nests are discovered during the first year of post-construction raptor nest surveys (the first raptor nesting season after construction is completed), the investigators shall monitor those nest locations during the second year of surveys in the fourth year after construction is completed. Thereafter, the investigators shall monitor all known burrowing owl nest locations as a part of the long-term raptor nest monitoring program described in Section 2(b) below.

(b) Long-Term Monitoring

In addition to the two years of post-construction raptor nest surveys described in Section 2(a), the investigators shall conduct long-term raptor nest surveys at 5-year intervals for the life

of the facility.[7] Investigators will conduct the first long-term raptor nest survey in the raptor nesting season of the ninth year after construction is completed and will repeat the survey at 5-year intervals thereafter. In conducting long-term surveys, the investigators will follow the same survey protocols as described above in Section 2(a) unless the investigators propose alternative protocols that are approved by the Department. In developing an alternative protocol, the investigators will consult with ODFW and will take into consideration other monitoring conducted in adjacent areas. The investigators will analyze the data and report after each year of long-term raptor nest surveys.

(c) Analysis

The investigators will analyze the raptor nesting data to determine whether a reduction in either nesting success or nest use has occurred in the survey area. If the analysis indicates a reduction in nesting success or nest use by Swainson's hawks, ferruginous hawks or burrowing owls, then the certificate holder will propose appropriate mitigation for the affected species as described in Section 2(d) and will implement mitigation as approved by the Department, subject to review by the Council.

Reductions in nesting success or nest use could be due to operation of the MWPF, operation of another wind facility in the vicinity or some other cause. The investigators shall attribute the reduction to operation of the MWPF if the wind turbine closest to the affected nest site is an MWPF turbine, unless the certificate holder demonstrates, and the Department agrees, that the reduction was due to a different cause. At a minimum, if the analysis shows that a Swainson's hawk, ferruginous hawk or burrowing owl has abandoned a nest territory within the facility site or within ½ mile of the facility site or has not fledged any young over two successive surveys within that same area, the investigators will assume the abandonment or unsuccessful fledging is due to operation of the facility unless another cause can be demonstrated convincingly.

Given the low raptor nesting densities in the area and the presence of other wind energy facilities nearby, statistical power to detect a relationship between distance from an MWPF 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.

(d) Mitigation

If the analysis shows a reduction in nesting success or nest use, the certificate holder shall implement mitigation if the Department determines 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. In proposing appropriate mitigation, the certificate holder shall advise the Department if any other wind project in the area is obligated to provide mitigation for a reduction in raptor nesting success at the same nest site. 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

[7] As used in this plan, "life of the facility" means continuously until the facility site is restored and the site certificate is terminated in accordance with OAR 345-027-0110.

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.

3. Washington ground squirrel surveys

The certificate holder shall conduct long-term post-construction surveys to collect data on Washington ground squirrel (WGS) activity within the site boundary. A qualified professional biologist will monitor the WGS sites in the MWPF area identified during the pre-construction surveys (2008 through 2010) and the buffer area within 785 feet in all directions from the identified WGS sites in suitable habitat. The certificate holder shall conduct surveys during the year following construction and every three years thereafter for the life of the facility. Surveyors will walk standard protocol-level transects twice between late March and late May and record level of use, notes on natal sites, physical extent of the sites and any noticeable land use or habitat changes that may have occurred since the initial 2008–2010 survey period. Maps and survey results will be provided to the Department as part of the annual reporting.

4. Wildlife Reporting and Handling System

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

All avian and bat carcasses discovered by maintenance personnel will be photographed and the data recorded as would be done for carcasses within the formal search sample during scheduled searches. If maintenance personnel discover incidental finds, the maintenance personnel will notify a project biologist. The project biologist must be a qualified independent professional biologist who is not an employee of the certificate holder. The project biologist (or the project biologist's experienced wildlife technician) will collect the carcass or will instruct maintenance personnel to have an on-site carcass handling permittee collect the carcass. The certificate holder's on-site carcass handling permittee must be a person who is listed on state and federal scientific or salvage collection permits and who is available to process (collect) the find on the day it is discovered. The find must be processed on the same day as it is discovered.

During the years in which fatality monitoring occurs, if maintenance personnel discover incidental finds outside the search plots for the fatality monitoring searches, the data will be reported separately from fatality monitoring data. If maintenance personnel discover carcasses within search plots, the data will be included in the calculation of fatality rates. The maintenance personnel will notify a project biologist. The project biologist will collect the carcass or will instruct maintenance personnel to have an on-site carcass handling permittee collect the carcass. As stated above, the on-site permittee must be available to process the find on the day it is discovered. 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 wildlife monitoring data and analysis to the Department for each calendar year in which wildlife monitoring occurs. Monitoring data include fatality monitoring program data, raptor nest survey data, WGS survey data, WGS incidental observation and assessment reports, and WRHS data. The certificate holder may include the reporting of wildlife monitoring data and analysis in the annual report required under OAR 345-026-0080 or submit this information 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 notify USFWS and ODFW immediately if 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 final versions of reports that are required under this plan, the Department will make the reports available to the public on its website and will specify a time in which the public may submit comments to the Department.[9]

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.

[9] 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.

Montague Wind Project: Habitat Mitigation Plan

[MARCH XX, 2010]

I. Introduction

This plan describes methods and standards for preservation and enhancement of an area of land near the Montague Wind Power Facility (MWF) to mitigate for the impacts of the facility on wildlife habitat.[1] This plan addresses mitigation for both the permanent impacts of facility components and the temporal impacts of facility construction. The certificate holder shall protect and enhance the mitigation area as described in this plan. This plan specifies habitat enhancement actions and monitoring procedures to evaluate the success of those actions. Remedial action may be necessary if progress toward habitat enhancement success is not demonstrated in any part of the mitigation area.

II. Description of the Impacts Addressed by the Plan

The estimated land area that could be occupied by permanent facility components (the "footprint") is approximately 220 acres, based on the final design configuration for MWF. In addition to the footprint impacts, construction of the facility could disturb approximately 1,717 acres. Although much of the area is cropland, habitat that could be affected by construction disturbance includes areas of perennial bunchgrass, desirable shrubs and juniper trees. After disturbance, the recovery of perennial bunchgrass species to a mature stage might take five to seven years; recovery of juniper trees and desirable shrubs such as bitterbrush and sagebrush might take ten to 30 years to reach maximum height and vertical branching. Even where recovery of these habitat subtypes is successful, there is a loss of habitat quality during the period of time needed to achieve recovery (temporal impact).

III. Calculation of the Size of the Mitigation Area

The actual footprint and construction disturbance areas cannot be determined until the final design layout of the facility is known. Before beginning construction of the facility, the certificate holder shall provide to the Oregon Department of Energy (Department) a map showing the final design configuration of the facility and a table showing the estimated areas of permanent impacts and construction area impacts on habitat (by category, habitat types and habitat subtypes). The certificate holder shall calculate the size of the mitigation area, as illustrated below, based on the final design configuration of the facility. The certificate holder shall implement the habitat enhancement actions described in this plan, after the Department has approved the size of the mitigation area. This plan does not address additional mitigation that might be required under the Montague Wildlife Monitoring and Mitigation Plan.

The mitigation area must be large enough to meet the habitat mitigation goals and standards of the Oregon Department of Fish and Wildlife (ODFW) described in OAR 635-415-0025. The ODFW goals require mitigation to achieve "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.

[1] This plan is incorporated by reference in the site certificate for the Montague Wind Power Facility 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.

For the footprint impacts, the mitigation area includes two acres for every one acre of Category 2 habitat affected (a 2:1 ratio) and one acre for every acre of footprint impacts to Category 3, 4 and 5 habitat (a 1:1 ratio). The 2:1 ratio for Category 2 is intended to meet the ODFW goals of "no net loss" of Category 2 habitat and "net benefit" of habitat quantity for impacts to both Category 2 and Category 5 habitat. The 1:1 ratio for the footprint impacts to Category 3, 4 and 5 habitat is intended to meet the ODFW goal of "no net loss" of habitat in these categories.

To mitigate for construction impacts outside the footprint, the mitigation area includes ½ acre for every Category 2 or 3 SSA (shrub-grass; sagebrush-rabbitbrush-snakeweed/bunchgrass-annual grass) and WJ (juniper woodland) habitat affected (a 0.5:1 ratio). This portion of the mitigation area is intended to address the temporal loss of habitat quality during the recovery of SSA and WJ habitat disturbed during construction. The size of this portion of the mitigation area is based on the assumption that restoration of disturbed SSA and WJ habitat is successful, as determined under the Montague Revegetation Plan. If the revegetation success criteria are not met in the affected areas, then the Council may require the certificate holder to provide additional mitigation.

Areas of potential impact within each affected habitat category and the corresponding mitigation area for each category are calculated as follows, based on maximum habitat impact estimates:[3]

Category 2

Footprint impacts: 43.4 acres

Temporary impacts to SSA and WJ: 112.6 acres

Mitigation area requirement: (43.5 acres x 2) + (112.6 acres x 0.5) = 143.2 acres

Category 3

Footprint impacts: 76.0 acres

Temporary impacts to SSA: 3.6 acres

Mitigation area: 76 acres + (3.6 acres x 0.5) = 77.8 acres

Category 4

Footprint impacts: 7.4 acres

Mitigation area requirement: 7.4 acres

Total mitigation area for MWF (rounded to nearest whole acre): 228 acres

IV. Description of the Mitigation Area

The certificate holder shall select a mitigation area in proximity to the facility where habitat protection and enhancement are feasible consistent with this plan.[4] The applicant

[3] The maximum impact estimates are shown in Table P-10 of the Application for Site Certificate and Table TBD of the Draft Proposed Order on the Application .

identified a 440-acre parcel in a relatively remote setting where habitat protection and enhancement are feasible and sufficient land area is available to accommodate the size of the mitigation area, based on a worst-case estimate.[5] Within the 440-acre parcel, 252 acres have recently been protected by conservation easements in association with other wind energy projects including the Leaning Juniper II Wind Power Facility; the certificate holder has an option for establishing a conservation easement on the remaining 188 acres.[6] If more than 188 acres are required for the MWF mitigation area, the certificate holder also has access to a second conservation easement area approved by the Department and ODFW. Enhancement opportunities have been validated; the habitat experienced recent wildfires. Before beginning construction of the facility, the certificate holder shall determine the final size of the mitigation area needed for the facility. The certificate holder shall determine the boundaries of the mitigation area in consultation with ODFW and the affected landowners and subject to the approval of the Department. The final mitigation area must contain suitable habitat to achieve 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 through appropriate enhancement actions. Before beginning construction of the facility, the certificate holder shall acquire the legal right to create, maintain and protect the habitat mitigation area needed for the life of the facility by means of an outright purchase, conservation easement or similar conveyance and shall provide a copy of the documentation to the Department.[7]

V. Habitat Enhancement Actions

The objectives of habitat enhancement are to protect habitat within the mitigation area from degradation and to improve the habitat quality of the mitigation area. By achieving these goals, the certificate holder can address the permanent and temporal habitat impacts of the MWF and 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 shall initiate the habitat enhancement actions for the facility as soon as the final design configuration is known and the size of the mitigation area has been determined and approved by the Department. The certificate holder shall implement the following enhancement actions:

1) Modification of Livestock Grazing Practices. The certificate holder shall restrict grazing within the habitat mitigation area. Eliminating livestock grazing within the mitigation area during most of the year will enable recovery of native bunchgrass and sagebrush in areas where past grazing or recent (2008) wildfires have occurred, resulting in better vegetative structure and complexity for a variety of wildlife. Reduced livestock grazing may be used as a vegetation management tool, limited to the period from February 1 through April 15.

---

[4] OAR 635-415-0005 defines "in-proximity habitat mitigation" as follows: "habitat mitigation measures undertaken within or in proximity to areas affected by a development action. For the purposes of this policy, 'in proximity to' means within the same home range, or watershed (depending on the species or population being considered) whichever will have the highest likelihood of benefiting fish and wildlife populations directly affected by the development."

[5] The 440-acre parcel is described in Section IV.4.(b)(F) of the Final Order on the Application.

[6] Figure P-11 in the Application for Site Certification.

[7] As used in this plan, "life of the facility" means continuously until the facility site is restored and the site certificate is terminated in accordance with OAR 345-027-0110.

2) Shrub Planting. The certificate holder shall plant sagebrush shrubs in locations where existing sagebrush is stressed or was negatively impacted by fire. The certificate holder shall determine the size of the shrub-planting area based on the professional judgment of a qualified biologist after a ground survey of actual conditions. The size of the shrub-planting area will depend on the available mitigation area and opportunity for survival of planted shrubs. The shrub survival rate at four years after planting is an indicator of successful enhancement of habitat quality to Category 2. Accordingly, although a minimum 10-acre area of shrub planting is anticipated, the certificate holder may choose to plant a larger area. The certificate holder shall complete the initial sagebrush planting within one year after the beginning of construction of the MWF. Supplementing existing but disturbed sagebrush areas with sagebrush seedlings would assist the recovery of this valuable shrub-steppe component. The certificate holder shall obtain shrubs from a qualified nursery or grow shrubs from native seeds gathered from the mitigation area. The certificate holder shall identify the area to be planted with sagebrush shrubs after consultation with ODFW and subject to final approval by the Department. The certificate holder shall mark the planted sagebrush clusters at the time of planting for later monitoring purposes and shall keep a record of the number of shrubs planted.

3) Tree Planting. If areas of juniper woodland are disturbed during construction, the certificate holder shall plant juniper trees in the mitigation area in locations of deeper soils near canyon bottoms. The certificate holder shall assess specific locations and provide a map of possible planting locations to ODFW and the Department before planting begins. The certificate holder shall determine the number and size of the juniper tree plants based on the professional judgment of a qualified biologist after a ground survey of actual conditions. The size of the tree-planting area will depend on the available mitigation area and opportunity for survival of planted trees. The tree survival rate at four years after planting is an indicator of successful enhancement of habitat quality to Category 2. The certificate holder shall obtain trees from a qualified nursery or suitable transplants from MWF construction zones. The certificate holder shall identify the area to be planted with juniper trees after consultation with ODFW and subject to final approval by the Department. The certificate holder shall mark the planted trees at the time of planting for later monitoring purposes and shall keep a record of the number of trees planted.

4) Weed Control. The certificate holder shall implement a weed control program. Under the weed control program, the certificate holder shall monitor the mitigation area to locate weed infestations. The certificate holder shall continue weed control monitoring, as needed, for the life of the facility. As needed, the certificate holder shall use appropriate methods to control weeds. Weed control on the mitigation site will reduce the spread of noxious weeds within the habitat mitigation area and on any nearby grassland, CRP or cultivated agricultural land. Weed control will promote the growth of desirable native vegetation and planted sagebrush. The certificate holder may consider weeds to be successfully controlled when weed clusters have been eradicated or reduced to a non-competing level. Weeds may be controlled with herbicides or hand-pulling. The certificate holder shall notify the landowner of the specific chemicals to be used on the site and when spraying will occur. To protect locations where young desirable forbs may be growing, spot-spraying may be used instead of total area spraying.

5) Fire Control. The certificate holder shall implement a fire control plan for wildfire suppression within the mitigation area. The certificate holder shall provide a copy of the fire control plan to the Department before starting habitat enhancement actions. The certificate holder shall include in the plan appropriate fire prevention measures, methods to detect fires that occur and a protocol for fire response and suppression. The certificate holder shall maintain fire control for the life of the facility. If any part of the mitigation area is damaged by wildfire, the certificate holder shall assess the extent of the damage and implement appropriate actions to restore habitat quality in the damaged area.

6) Nest platforms. The certificate holder shall construct at least one artificial raptor nest platform in the mitigation area tailored to the opportunities of the site, using best professional judgment of raptor use in the general area. The certificate holder may construct more than one nest platform based on the availability of suitable locations. The certificate holder shall maintain the nest platforms for the life of the facility.

7) Habitat Protection. The certificate holder shall restrict uses of the mitigation area that are inconsistent with the 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.

VI. Monitoring

1. Monitoring Procedures

The certificate holder shall hire a qualified investigator (an independent botanist, wildlife biologist or revegetation specialist) to conduct a comprehensive monitoring program for the mitigation area. The purpose of this monitoring is to evaluate on an ongoing basis the protection of habitat quality, the results of enhancement actions and the use of the area by avian and mammal species, especially during the wildlife breeding season.

The investigator shall monitor the habitat mitigation area for the life of the facility beginning in the year following the initial sagebrush planting. The investigator shall visit the site as necessary to carry out the following monitoring procedures:

1) Annually assess vegetation cover (species, structural stage, etc.) and progress toward meeting the success criteria.

2) Annually record environmental factors (such as precipitation at the time of surveys and precipitation levels for the year).

3) Annually record any wildfire that occurs within the mitigation area and any remedial actions taken to restore habitat quality in the damaged area.

4) Annually assess the success of the weed control program and recommend remedial action, if needed.

5) Assess the recovery of native bunchgrass and natural recruitment of sagebrush resulting from removal of livestock grazing pressure and recovery post-fire by comparing the quality of bunchgrass and sagebrush cover at the time of each monitoring visit with the quality observed in previous monitoring visits and as observed when the mitigation area was first established. The investigator shall establish photo plots of naturally recovering sagebrush and native bunchgrass during the first year following the beginning of construction of the MWF. The investigator

shall take comparison photos in the first year and in every other year thereafter until the subject vegetation has achieved mature stature. The investigator shall determine the extent of successful recovery of native bunchgrass based on measurable indicators (such as, signs of more abundant seed production) and shall report on the progress of recovery within in the monitoring plots. The investigator shall report on the timing and extent of any livestock grazing that has occurred within the mitigation area since the previous monitoring visit.

6) Assess the survival rate and growth of planted sagebrush. At the time of planting, sagebrush clusters will be marked for the purpose of monitoring. The investigator shall select several planted clusters for photo monitoring and shall take close-up and long-distance digital images of each selected cluster during each monitoring visit. The certificate holder shall determine the number of clusters to be photo-monitored at the time of planting, in consultation with the Department and ODFW, based on the number of clusters planted. The investigator shall take comparison photos in the first year following the initial sagebrush planting and in every other year thereafter until the surviving planted sagebrush has achieved mature stature. In each monitoring year, the investigator shall determine and report the survival rate of planted sagebrush. Based on past experience of restoration specialists for other sagebrush planting projects, a survival rate as high as 50 percent can be achieved if there are years of high soil moisture, but a more typical survival rate is 2 surviving shrubs per 10 planted (20 percent) after four years. Shrub-planting will be considered successful if a 20-percent survival rate is achieved after four years. The investigator shall recommend remedial action when, in the investigator's judgment, the survival rate of planted sagebrush is inadequate to demonstrate a trend toward an improvement in habitat quality.

7) Assess the survival rate and growth of planted juniper trees. At the time of planting, juniper trees will be marked for the purpose of monitoring. The investigator shall select several planted trees for photo monitoring and shall take close-up and long-distance digital images of each selected tree during each monitoring visit. The certificate holder shall determine the number of trees to be photo-monitored at the time of planting, in consultation with the Department and ODFW, based on the number of trees planted. The investigator shall take comparison photos in the first year following planting and in every other year thereafter until the surviving planted trees have achieved mature stature. In each monitoring year, the investigator shall determine and report the survival rate of planted trees and shall note overall vigor, height of tree and the extent of branching. Based on past experience of restoration specialists, one in five planted juniper trees may typically survive. Juniper planting will be considered successful when, in the investigator's judgment, one in five have survived. The investigator shall recommend remedial action when, in the investigator's judgment, the survival rate is inadequate to demonstrate a trend toward an improvement in habitat quality.

8) Between April 21 and May 21 beginning in the first spring season after the beginning of construction of the MWF, conduct an area search survey of avian species. An "area search" survey consists of recording all birds seen or heard in specific areas (for example, square or circular plots that are 5 to 10 acres in size). Area searches will be

conducted during morning hours on days with low or no wind. The investigator shall determine the number searches and the number of search areas in consultation with ODFW. The investigator shall repeat the area search survey every five years during the life of the facility.

9) Beginning in the first year after the beginning of construction of the MWF and repeating every five years during the life of the facility, the investigator shall record observations of special status plant or wildlife species (federal or state threatened or endangered species and state sensitive species) during appropriate seasons for detection of these species.

The certificate holder shall report the investigator's findings and recommendations regarding the monitoring of the mitigation area to the Department and to ODFW on an annual basis. In the annual report, the certificate holder shall describe all habitat mitigation actions carried out during the reporting year. The report to the Department may be included as part of the annual report on the MWF.

2. **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. ODFW has advised the Department that protection of habitat alone (without enhancement activity) will not meet the intent of the "net benefit" goal.

The certificate holder must protect a sufficient quantity of habitat in each category to meet the mitigation area requirements calculated under Section III based on the final design configuration of the facility. The certificate holder shall determine the actual mitigation area requirements for the facility, subject to Department approval, before beginning construction of the facility. 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, survival of planted shrubs and juniper trees, 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 four years after the initial sagebrush planting, the certificate holder shall propose remedial action. The Department may require supplemental planting or other corrective measures.

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 supplemental

planting, other corrective measures and additional monitoring as necessary to ensure that the habitat quantity goals are achieved and maintained.

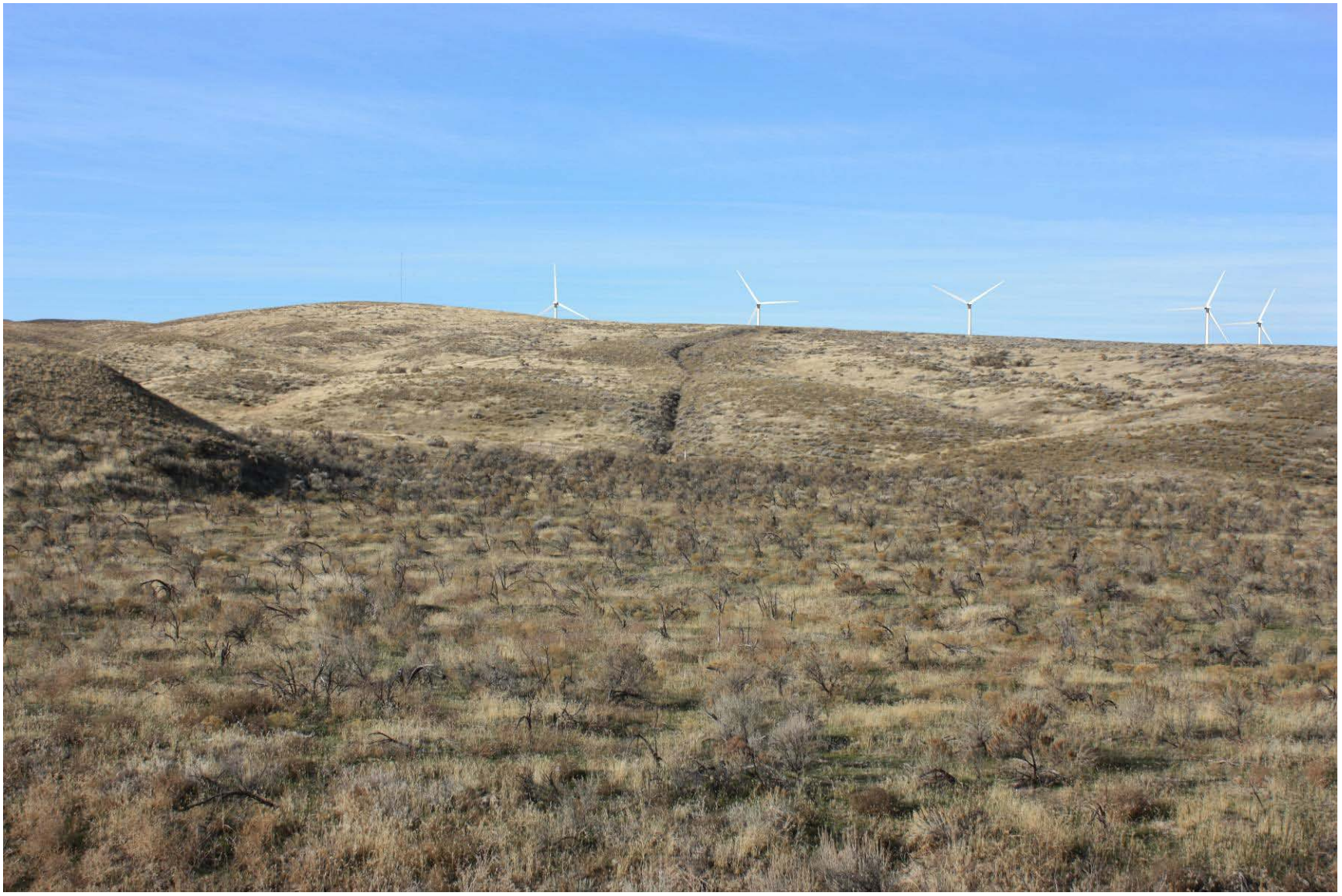
VII. Amendment of the Plan

This Habitat Mitigation Plan may be amended from time to time by agreement of the certificate holder and the Oregon Energy Facility Siting Council ("Council"). Such amendments may be made without amendment of the site certificate. The Council authorizes the Department to agree to amendments to this plan. The Department 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 Department.

ATTACHMENT R-1

Visual Simulations from Bureau of Land Management Interpretive Site

Looking West at the GE 1.5-MW Montague Turbines from the Fourmile Canyon BLM Interpretive Site.



Looking West at the GE 3.0-MW Montague Turbines from the Fourmile Canyon BLM Interpretive Site.

Looking South at the GE 2.5-MW Shepherds Flat Turbines from the Fourmile Canyon BLM Interpretive Site.

ATTACHMENT S-1

Cultural Resources Documentation

CONFIDENTIAL AND PROVIDED UNDER SEPARATE COVER

ATTACHMENT T-1

Maps Showing Oregon Parks and Recreation Department Properties

Proposed Montague Wind Power Facility - Site Assessment Review

Oregon Parks & Recreation Dept.
725 Summer St. NE, Suite C
Salem OR, 97301

Recreation Buffer
Scenic View Buffer
Protected Species Buffer
Federal Wild & Scenic River Boundary
N

Arlington
Arlington
84
84
19
74
Rufus
97
206
Wasco
John Day,
Hilderbrand
206
Moro
J.S. Burres
Cottonwood Canyon
State Park
97
19
Ione
207
Lexington
74
Grass Valley
216

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Oregon Lambert Projection
Datum NAD 83

0 5 10 20 Miles

tc 2-23-2010

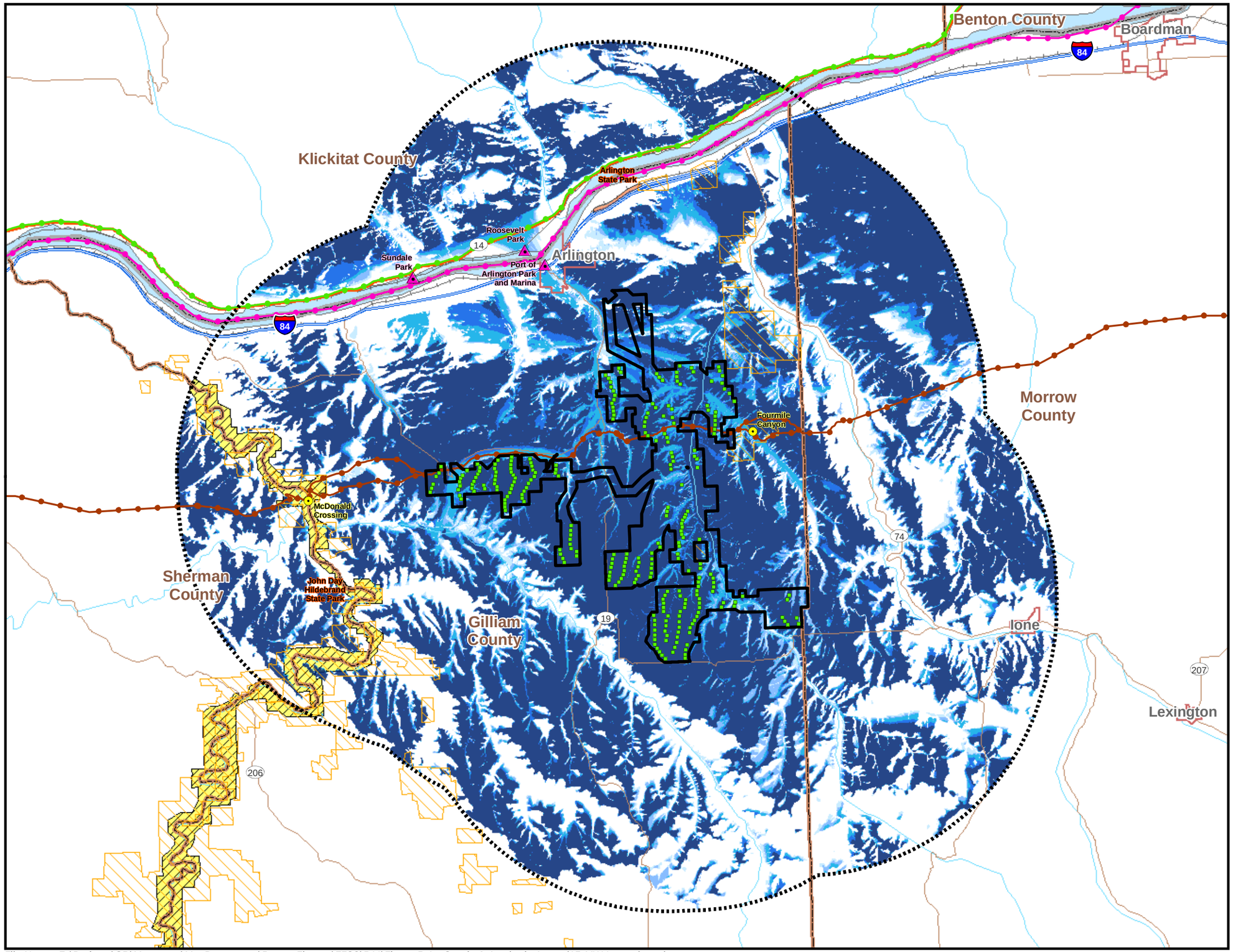


Figure R-1

Scenic & Aesthetic Areas

1.5-MW Turbine Layout
(Maximum Turbine Layout)

Montague Wind Power Facility

Legend

- Site Boundary/Micrositing Corridor
- 10-mile Analysis Area
- Proposed Turbine
- Oregon Trail (Approximate Route)
- Oregon Trail High-Potential Site

Lewis & Clark Trail

- Water Trail (Approximate 1804 Route)
- Motor Route (Approximate 1806 Route)
- Lewis and Clark Trail Potential Site
- Oregon State Park
- John Day Wild and Scenic River/John Day State Scenic Waterway
- BLM Land
- State Boundary
- Limited Access Highway
- Highway
- Major Road
- Major Railroad Line
- River
- Water
- City Limit
- County Boundary

# of Visible Turbines

- 1 - 5
- 6 - 10
- 11 - 30
- 31 - 50
- > 50

Note:
ZVI analysis assumes 269 1.5-MW turbines.

Source: Lewis and Clark Trail information from National Park Service (Ms. Denise Nelson) and the National Park Service, 1982, Lewis and Clark National Historic Trail, Comprehensive Management and Use Plan

N
W E
S

0 1 2 3 4 5

IBERDROLA RENEWABLES

File Name: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\RAI\Figure R-1 - Scenic & Aesthetic Areas (15-MW Layout).mxd

Modified Date: 3/25/2010

Figure T-1

Recreational Facilities and Opportunities

1.5-MW Turbine Layout
(Maximum Turbine Layout)

Montague Wind Power Facility

KLICKITAT COUNTY
GILLIAM COUNTY
MORROW COUNTY
SHERMAN COUNTY

Arlington State Park
Roosevelt Park
Earl Snell Park
City Park
Roosevelt
Port of Arlington Park and Marina
Arlington
Alkali Park
China Creek Golf Course
Heppner Hwy
Rattlesnake Rd
Bialock Canyon Rd
Cedar Springs Ln
Oregon Highway 19 Monument
Fourmile Canyon
Fourmile Rd
McDonald Crossing
John Day, Hilderbrand State Park
Cottonwood Canyon State Park
Oregon Hwy 19 - John Day Hwy
Baseline Rd
Mcnabb Ln
Ione

- Site Boundary
- Micrositing Corridor
- 5-mile Recreational Opportunity Analysis Area
- Recreational Facilities and Opportunities
- Oregon Trail High-Potential Site
- Oregon Trail (Approximate Route)
- Lewis & Clark Trail (Approximate Route)
- Oregon State Park
- Proposed Turbine
- City Limit
- River
- Water
- Limited Access Highway
- Highway
- Major Road
- State Boundary
- County Boundary

N
W E
S

0 1 2 3 4 5
Miles

IBERDROLA RENEWABLES

File Name: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\RAI\Figure T-1 - Recreational Facilities & Opportunities.mxd

Modified Date: 3/22/2010

ATTACHMENT U-1

Revised Figure U-3, Highway 19 Road Approaches

Figure U-3

Highway 19
Road Approaches

1.5-MW Turbine Layout
(Maximum Turbine Layout)

Montague Wind Power Facility

- Site Boundary
- Micrositing Corridor
- Highway 19 Approach - LJIIB
- Highway 19 Approach - Montague

Proposed Permanent Facilities

- Proposed Turbine
- Proposed Met Tower
- Proposed New Turbine Road
- Proposed New Met Tower Road
- Proposed Improved Road
- Proposed Underground 34.5-kV Line
- Proposed Overhead 34.5-kV Line
- Proposed 230-kV Transmission Line
- Proposed 5-Acre Facility Collector Substation
- Proposed 10-Acre O&M Facility and Staging Area
- Alternate 10-Acre O&M Facility and Staging Area

Proposed Temporary Facilities

- Proposed Crane Path
- Proposed 2.5-Acre Staging Area
- Proposed 5-Acre Staging Area

Existing Facilities

- Existing Transmission Line
- Public Road
- Private Road
- Major Railroad Line
- Streams

N
W E
S

0 0.5 1 1.5
Miles

IBERDROLA RENEWABLES

File Name: Z:\Projects\OR\Montague\MapDocuments\Report Figures\EFSC\RAI\Figure U-3 - Highway 19 Road Approaches.mxd

Modified Date: 3/19/2010

ATTACHMENT V-1

Oregon State University Extension Service Letters on Site Restoration

Extension Service
Gilliam County

OSU

OREGON
STATE
UNIVERSITY

333 South Main Street
PO Box 707
Condon, Oregon 97823

Telephone
541-384-2271
Fax
541-384-2571

January 29, 2010

Sara Parsons
Business Developer
Development West
1135 NW Couch Street STE 700
Portland, OR 97209

Dear Ms Parsons,

Regarding the Energy Facility Siting Council questions pertaining to the Iberdrola Renewables wind energy development plan, I would like to provide the following input on the proposal.

It is my understanding the wind tower siting contracts include a provision for restoration of the land following decommissioning. Once the towers are removed and concrete foundations buried three feet below the land surface, returning the land to crop production should pose few problems to future agricultural management.

The restoration process will likely include the replacement of top soil to fill in any void left by tower removal. For this reason, it is important that the productive top soil strata be isolated at the time of removal from subsoil components in the soil profile. The mixing of the top soil & subsoil components could have a negative impact on future land productivity after restoration takes place.

Other than this observation, I would note that this type of shallow cut and fill soil movement has been a historic practice in this region with the construction of erosion control structures. Land is generally not significantly impacted by this type of activity. Once the land is returned to farming, typical tillage depth in this region is approximately 8 inches, and rarely over one foot in depth. In most cases, the buried foundation mass would lie well below the level of most tillage activity.

The exception to this general observation would be instances where deep tillage such as subsoiling might be complicated by the presence of buried power cables, or in other instances where area soils are deep enough that plant rooting depth could be impaired by the presence of the buried concrete foundations.

Soil testing is recommended after the restoration effort to determine whether or not additional fertilizer will be required to return the land to full productivity. Access roads used during project construction and

maintenance may require a ripping operation to mitigate the impact of soil compaction on future land productivity. If the land is not returned to crop production, I would recommend the seeding of tower sites to an adapted grass mix that will complete with noxious weeds and minimize the loss of soil due to wind and water erosion.

I hope this information is helpful to you in considering the impact of wind tower site decommissioning. Feel free to contact me if you have questions concerning this input to the EFSC process.

Sincerely yours,

Jordan B. Maley
Dryland Cropping Systems Extension Agent
Oregon State University Extension Service – Gilliam County

Cc: file, CH2MHill

Extension Service Sherman County
Oregon State University, 409 Hood Street, PO Box 385, Moro, OR 97039
T 541-565-3230 | F 541-565-3330 | http://extension.oregonstate.edu/sherman/

January 8, 2010

Sara Parsons
Business Developer
Development West
1135 NW Couch Street STE 700
Portland, OR 97209

Ms Parsons,

I have been asked to comment on the proposed Montague Wind Facility especially in regards to the impact it may have on ag production when the towers might be removed.

Although this project is not in my normal work area, it does involve dryland wheat production, so I can tell you how it may impact the generalities. I am not familiar with those soils and their particular properties in the proposed project area..

In general, in the tillage systems used today in most of the dryland areas (low rainfall; 10-14 inches of precipitation per year), the producers rarely till the soil any deeper than a foot. Deep tillages would include a heavy shank on a subsoiler unit which may reach 3 feet deep. This would likely be less a concern on the crops than it might on buried power lines.

We have seen areas where the buried lines are placed erratically beneath the soil surface, especially when crossing structures that have been built into the field for conservation purposes. My suggestion is that whenever you plan to cross one of these structures that the crew works with the local USDA office of the Natural Resource Conservation Service (NRCS). They are responsible for the design of the structures and working with them will help maintain the integrity of the structure and protect the grower and the wind company from potential damage to the buried lines.

On the tower site itself, having watched closely the construction of many towers, I know that the contractor clears the soil off to one side, builds the concrete base and then covers it with the soil removed from that site. I have not looked specifically at those sites to see if there is any reduction in stand or yield although there have been a few rocks on the site surface.

When the towers are removed, I assume the concrete base will be removed at the same time. In order to prevent any subsequent crop damage, it would be important to see that the soil dug away from the concrete pad, be returned as fill in the same order as it is removed from the hole. The topsoil has developed organic matter and a nutrient base not found in lower or

substrata soils. Returning a lower quality soil to the top of the hole can bring a reduction in yield, an increase in farm expenses and greater exposure to soil erosion.

And for now at least, the main crop produced in these areas is wheat. The wheat, even though it is an annual, regularly roots down six feet or more. Rooting is obviously less if there is a soil pan obstruction (high water table, calcified soil layer, bedrock etc) that prevents the roots from going deeper. In restoring the sites to original production capacity, you would need to be sure there is at least a soil depth of 6 feet, or at least to the level of the surrounding limiting layer depth, so as not to impede root development.

Soil testing is recommended after the restore effort to see if additional fertilizer will be required.

If the site is not returning to crop production, it is recommended that a good mixture of grass be planted to keep competing noxious weeds from invading or becoming established in the area.

Access roads may need a further deep ripping action to reduce the impacts of soil compaction from the heavy loads used in the area.

Again, my recommendations are centered on the production of wheat. Over time, we may see a shifting of crops, which could impact some of the specifics.

Those are key points to consider in returning wind tower sites to production capability.

Sincerely,

Sandy Macnab
Oregon State University Extension
Sherman County Agent

cc: Schulz, Maley, Lutcher

ATTACHMENT X-1

Detailed Noise Data and Technical Specifications

CONFIDENTIAL AND PROVIDED UNDER SEPARATE COVER