Request for Amendment 2 to the Shepherds Flat South Site Certificate

Prepared for
Horseshoe Bend Wind, LLC

Prepared by

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Table of Contents

List of Tables

List of Figures

Attachments

Acronyms and Abbreviations

AINW	Archaeological Investigations Northwest, Inc.
ASC	Application for Site Certificate
ASCE	American Society for Civil Engineers
BLM	U.S. Bureau of Land Management
BMP	best management practice
Caithness	Caithness Energy, LLC
Certificate Holder	Horseshoe Bend, LLC
Council	Oregon Energy Facility Siting Council
dBA	A-weighted decibels
DOGAMI	Oregon Department of Geology and Mineral Industries
FAA	Federal Aviation Administration
Facility	Shepherds Flat South
GCZO	Gilliam County Zoning and Land Development Ordinance
L_{50}	sound pressure level exceeded 50 percent of the time
MW	megawatts
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSR	noise sensitive receptors
O&M	operations and maintenance
OAR	Oregon Administrative Rules
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ORS	Oregon Revised Statutes
OWRD	Oregon Water Resources Department
PCFM	post-construction fatality monitoring
RFA	Request for Amendment
RPS	Oregon's Renewable Portfolio Standard
SHPO	State Historic Preservation Office

TCP	Traditional Cultural Property
WAGS	Washington ground squirrel
WMMP	Wildlife Monitoring and Mitigation Plan
ZVI	Zone of Visual Influence

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1.0 Introduction and Request

Shepherds Flat South (the Facility) is an operational wind energy facility with 116 turbines and a maximum generating capacity of 290 megawatts (MW), located within a Site Boundary of approximately 15,928 acres in Gilliam and Morrow counties. The certificate holder for the Facility is Horseshoe Bend Wind, LLC (Certificate Holder), a wholly owned subsidiary of Caithness Shepherds Flat, LLC (Shepherds Flat), itself a subsidiary of Caithness Energy, LLC (Caithness). The Facility is part of the Shepherds Flat Wind Farm, which also consists of Shepherds Flat North and Shepherds Flat Central. The certificate holders for Shepherds Flat North and Central are separate subsidiaries of Shepherds Flat.

The Certificate Holder is submitting this Request for Amendment (RFA) 2 to the Facility Site Certificate (Site Certificate) to upgrade (or repower) the Facility turbines to current technology by exchanging existing blades for longer turbine blades and associated turbine components on existing turbine towers. RFA 2 does not propose to increase the Site Boundary, permanent disturbance footprint of the Facility or approved height of the turbines. RFA 2 proposes changes to Condition 26 of the Site Certificate to allow a minimum allowed blade tip clearance of 21.5 meters.

1.1 Existing Site Certificate and Prior Amendments

The Certificate Holder obtained a Site Certificate for the Shepherds Flat Wind Farm from the Oregon Energy Facility Siting Council (Council) on July 25, 2008, approving construction of the Facility. Since 2008, the Certificate Holder has obtained Council approval to divide the Shepherds Flat Wind Farm into the three facilities, each with their own site certificate. The division request was approved and issued on September 11, 2009. The Site Certificate on Amendment 1 was issued for the Facility on March 12, 2010. Amendment 1 authorized expansion of the Site Boundary to accommodate an alternative route for the transmission line to connect to the regional transmission system operated by Bonneville Power Administration. The Facility became operational in 2012.

1.2 Amendment Required under OAR 345-027-0050 and Review Process under OAR 345-027-0051

The Certificate Holder submitted an Amendment Determination Request for a Type B review to ODOE on May 21, 2019 to replace its existing turbine blades and their associated turbine components with longer blades for the Facility. On June 17, 2019, ODOE responded that at that time they were unable to make a determination of whether the RFA justified review under the Type B review process. ODOE noted in its letter that additional information and analysis was needed to support ODOE's evaluation, which could be provided in a revised request. RFA 2 provides the necessary information for the Department to determine that the Type B review process is the

appropriate process for the proposed change, as further validated with the following analysis of the Oregon Administrative Rule (OAR) 345-027-0057(8) evaluation criteria[1]:

> *OAR 345-027-0057(8) In determining whether a request for amendment justifies review under the type B review process described in 345-027-0051(3), the Department and the Council may consider factors including but not limited to:*
>
> > *OAR 345-027-0057(8)(a) The complexity of the proposed change;*

The primary purpose of RFA 2 is to take advantage of technological advances in wind turbines as part of long term operations and maintenance (O&M) planning for the Facility. The Site Boundary will not be changed, nor will the permanent Facility footprint. RFA 2 proposes to switch out the blades and associated machinery for new blades and associated machinery on existing turbine towers. Existing permanent facility infrastructure will be used to the maximum extent practicable to minimize temporary disturbance. Temporary disturbance as part of Facility upgrading will be less than temporary disturbance for Facility construction. Temporary disturbance during the upgrades will cover less area and have shallower depths of disturbance than during Facility construction, as road prisms are established and no earthwork is needed to support new, permanent facilities. The Certificate Holder has demonstrated that the temporary disturbance areas from Facility construction were revegetated as documented through the annual reporting that is submitted to ODOE (Site Certificate Condition 21). Likewise, temporary disturbance areas will be revegetated as part of the upgrading process. In general, RFA 2 is part of the long-term O&M program for the operating Facility.

RFA 2 requests only to change the minimum ground clearance, will not increase the approved height of the turbine, and will utilize existing Facility infrastructure to the maximum amount practicable; therefore the proposed changes lack complexity. There are several other site certificates with a Council approved minimum aboveground blade tip clearance that is the same or lower than that which is being requested in RFA 2: Montague and Golden Hills (14 meters), Summit Ridge (18 meters), and Wheatridge (21.5 meters). Ultimately, the turbine specifications for the upgraded turbines have been previously reviewed and approved by the Council for several other facilities.

At its February 22, 2019 meeting, the Council concurred with NextEra Energy's request that RFA 5 for the Stateline Wind Facility should be subject to the Type B review process. RFA 5 for the Stateline Wind Facility increased the turbine height and rotor diameter, and decreased the minimum aboveground blade tip clearance to allow for repowering the entire facility. Because this RFA 2 proposes only to modify one turbine specification that, as noted above, has been previously reviewed and approved by the Council, ODOE and the Council can similarly concur that proposed change is not complex and should be subject to the Type B review process.

[1] On August 1, 2019, the Oregon Supreme Court held that the Council amendment rules adopted by Administrative Order EFSC 5-2017 are invalid. On August 23, temporary amendment rules were adopted. This application is being submitted under the temporary amendment rules.

OAR 345-027-0057(8)(b) The anticipated level of public interest in the proposed change;

The Facility is not accessible to the public, as the Facility is in a remote area on private land. There will be no change to the previously approved Site Boundary or the physical footprint of the Facility (see Figure 1). There will also be no change to noise (see Section 6.17), visual impacts (see Section 6.10), or public safety (see Section 6.15). Therefore, public interest in the proposed change is anticipated to be minimal, if any. The Council has already addressed and imposed conditions, as necessary, for the Facility in response to past public comments during the siting process (ODOE 2008: 5). In fact, no interested person contested the Application for Site Certificate (ASC; ODOE 2008: 5). Upgrading the Shepherds Flat Wind Farm is anticipated to create up to 170 additional temporary jobs and will support investment in the local economy. Based on the prior lack of public interest and the limited nature of the proposed changes, no significant public interest is anticipated.

OAR 345-027-0057(8)(c) The anticipated level of interest by reviewing agencies;

Reviewing agencies commented on the original Site Certificate, which informed the development of the Site Certificate conditions. The Certificate Holder coordinated with agencies that may be interested in the proposed changes, such as Oregon Department of Fish and Wildlife (ODFW) and the Oregon Department of Geology and Mineral Industries (DOGAMI) (see Sections 6.3, 6.8, and 6.9) during preparation of this RFA. The Certificate Holder understands that the ODOE review process includes outreach to respective agencies as a matter of process, but it is anticipated that their interest will be low in comparison to other recent energy projects because of the limited scope of the proposed changes. The turbine dimensions that are being requested in RFA 2 have been reviewed and approved by the Council and reviewing agencies several times before at other facilities: Montague and Golden Hills (14 meters), Summit Ridge (18 meters), and Wheatridge (21.5 meters). Therefore, little interest is anticipated by reviewing agencies on the proposed change.

OAR 345-027-0057(8)(d) The likelihood of significant adverse impact; and

RFA 2 does not propose to add any new permanent ground disturbance, increase the Site Boundary or increase the height of turbines approved for use at the Facility. RFA 2 proposes a minor turbine specification change to lower the approved minimum aboveground blade tip clearance. This modification is not anticipated to change the previously authorized impacts to scenic resources, public safety, and avian species, or alter the noise profile of the Facility. As demonstrated in Section 6.0, there are no significant changes to impacts to resources. RFA 2 only proposes an equipment upgrade to an operational Facility, and proposed changes to total turbine dimensions that are minor in scale. Therefore, there is little likelihood of significant adverse impact.

OAR 345-027-0057(8)(e) The type and amount of mitigation, if any.

The Facility has an ODFW-approved Wildlife Monitoring and Mitigation Plan (WMMP), Habitat Mitigation Plan, and Revegetation Plan. Studies with respect to a lower blade tip clearance on avian mortality are limited; however, there will be no new significant impact (see Section 6.8). For these and the reasons described above, the Certificate Holder does not anticipate any new mitigation or changes to existing mitigation plans.

2.0 Certificate Holder Information – OAR 345-027-0060(1)(a)

OAR 345-027-0060(1) To request an amendment to the site certificate required by OAR 345-027-0050(3) and (4), the Certificate Holder shall submit a written preliminary request for amendment to the Department of Energy that includes the following:

OAR 345-027-0060(1)(a) The name of the facility, the name and mailing address of the Certificate Holder, and the name, mailing address, email address and phone number of the individual responsible for submitting the request.

2.1 Name of the Facility

Shepherds Flat South

2.2 Name and Mailing Address of the Certificate Holder

Horseshoe Bend Wind, LLC
c/o Caithness Energy, LLC
565 Fifth Avenue, 29th Floor
New York, NY 10017

2.3 Current Parent Company of Certificate Holder

Caithness Energy, LLC

2.4 Name and Mailing Address of the Individuals Responsible for Submitting the Request

Vandana Gupta
Vice President
Horseshoe Bend Wind, LLC
c/o Caithness Energy, LLC
565 Fifth Avenue, 29th Floor
New York, NY 10017
(971) 472-4572
vgupta@caithnessenergy.com

3.0 Detailed Description of the Proposed Change – OAR 345-027-0060(1)(b)

OAR 345-027-0060(1)(b) A detailed description of the proposed change, including:

The Certificate Holder is submitting this RFA 2 to the Facility Site Certificate to upgrade the Facility's operational turbines to current technology by replacing existing blades with longer turbine blades, which necessitates also updating the associated machinery on the existing turbine.

RFA 2 does not seek to enlarge the existing Site Boundary or change the permanent footprint of the Facility. The upgrade will allow each turbine to generate more electricity with no increase in permanent footprint.

Replacing old turbine components with modern, more technologically advanced equipment will increase the capacity and efficiency of the Facility by allowing the turbines to process low velocity winds that they currently cannot do as effectively. The maximum generating capacity of the Facility will not change. Each of the 116 turbines has a nameplate capacity of 2.5 MW, which will not change. However, the MW hours generated will increase, because the turbines will be able to produce more at each given wind speed, up to the maximum 2.5 MW per hour. The capacity factor (the percentage of total potential production that is produced given wind speed and availability) will increase by 20-30 percent.

One minor Site Certificate condition adjustment is needed to account for the change in turbine dimensions for the upgraded turbines. Specifically, Condition 26 will be amended to lower the minimum ground clearance from 25 meters to 21.5 meters. Upgrading the turbines will generally consist of:

- Replacing blades for longer and lighter blades and associated machinery on the existing turbine towers. Table 1 provides the existing and proposed upgraded turbine specifications and approved specifications:

Table 1. Turbine Specifications

Specification	Existing	Proposed	Approved per Condition 26 of Site Certificate
Maximum Turbine Height in meters	135	150	150
Hub Height in meters	85	85	105
Minimum Ground Clearance in meters	25	21.5	25

Upgrading the turbine components generally includes:

1. Replace the current 100-meter rotor diameter blades with larger 116 or 127-meter rotor diameter blades.
2. Replace the hub casting as part of the rotor upgrade.
3. A modification to the roof of the nacelle will be made to accommodate the replacement of the wind turbine drive train.
4. Install a new gearbox and upper bedplate.
5. Replace various electrical and controller components in the turbines to support the upgrades.

There will be no changes to the current tower or foundation, the current electrical infrastructure at the turbine, the Facility electrical collection system, or any other related or supporting facilities.

- Use of temporary construction areas (entirely in areas previously disturbed and approved for Facility construction) – These areas include temporary laydown areas used to stage construction and store equipment, as well as Facility access road improvements to move cranes and provide the necessary turning radius improvements for construction vehicles. There will be no improvement to public roads other than laying down new gravel, as needed, on existing graveled public roads. There also will be placement of the new and replaced blades and associated machinery in smaller laydown areas at each turbine. The temporary use of construction areas will not disturb these areas to the extent they were temporarily altered for Facility construction (i.e., they will not encompass the entire temporary disturbance area for Facility construction, nor require disturbance to the same depths as Facility construction). For example, the cranes may have one track on the access road and one track on areas that are vegetated on top of the road substrate. All temporarily disturbed areas will be revegetated according to Conditions 77and 84.

The general sequence to replace the components is as follows:

1. All of the upgrade components (Gearbox/bedplate, blades, hub, nacelle top and misc. equipment) are delivered by over the road trucks to the pad site.
2. These components are unloaded and staged adjacent to the turbine pad area, using various smaller cranes or telehandlers.
3. The track mounted crane mobilizes to the turbine pad area and sets up on the access road adjacent to the turbine.
4. The crane lowers the old rotor and sets it on the right or left side of the crane.
5. The rotor is disassembled and the components are staged for removal at the pad site.
6. The crane lowers old gearbox and sets it adjacent to the old blades.
7. The crane lifts the new gearbox into place.
8. The new blades and hub are assembled into a single unit for installation, adjacent to the turbine pad.
9. The crane picks and sets the new rotor.
10. The crane picks and sets the new nacelle top.
11. The track mounted crane leaves.
12. A smaller crane loads old blades, hub, gearbox, upper bedplate, nacelle top and any other associated materials onto trucks which are staged on the access road.
13. Materials are transported off site for proper disposal or recycling at a licensed facility consistent with the waste management conditions in the Site Certificate.

14. The crane mobilizes to the next turbine and the process repeats.

The upgrading will be completed on a rolling schedule. Turbines will be upgraded over an approximately 7-month time frame with typically 8-15 turbines off-line being upgraded at a time. It will take approximately 2 weeks to upgrade each turbine. There will be four crane crews including crane operation and tower work crews. There will also be other upgrade support crews. It is estimated that there will be approximately 60 workers on-site at one time.

The equipment used for upgrading will generally consist of cranes, semi-trucks and regular sized pick-up/operational trucks. There will be 4 cranes and approximately 12 to 20 regular sized pick-up/operational trucks at a time. It is estimated that there will be approximately 20 regular sized trucks in and out of the site a day during the upgrading process. Semi-trucks will deliver the cranes and turbine upgrade components and remove the old components. There will be approximately 28 semi-trucks in an out of the site on any day.

3.1 Effect of Proposed Changes on the Project – OAR 345-027-0060(1)(b)(A)

OAR 345-027-0060(1)(b)(A) a description of how the proposed change affects the facility

As noted above, replacing blades and associated mechanical equipment is typical to industry activities as part of long-term O&M programming to maximize efficiency of a Facility. The proposed change to the Site Certificate would not change how the Facility is operated, as previously approved by the Council. There would be no change to the previously approved Site Boundary, no new structures or permanent ground development, only the upgrading of the Facility to maximize the efficiency of the Facility by using updated technology. The upgrade would extend the useful life of the Facility by approximately 20 years (the Facility began operation in 2012 and was originally expected to have a 30-year useful life). More importantly, once upgraded, the Facility will have a 20-30 percent increase in performance, predominately at lower wind speeds. Ultimately, the proposed change would maximize the use of current technology, while supporting renewable energy production in the region.

3.2 Applicable Laws and Council Rules – OAR 345-027-0060(1)(b)(B)

OAR 345-027-0060(1)(b)(B) a description of how the proposed change affects those resources or interests protected by applicable laws and Council standards, and

There have been no changes to applicable local, state, or federal law that would prohibit the changes requested in this RFA 2. Compliance with applicable laws is integrated into the Site Certificate conditions, which have been complied with for all stages of the Facility development so far (i.e., pre-construction, construction, operations), as documented through the annual condition compliance report. Although a minor modification to the Site Certificate is being requested to provide for a lower aboveground blade tip clearance, RFA 2 can still comply with all other Site Certificate conditions, applicable laws, and Council rules.

In general, the proposed change does not affect the resources or interests protected by applicable laws and Council standards in a substantially different way than previously approved by the

Council. The Facility is operational, and the Site Boundary or footprint of the Facility would not be changed; therefore, there are no new areas or facilities that would need to be considered that were not previously evaluated. Ultimately, the Facility would be operated in the same manner as already approved by the Council and as documented through annual reporting that has been completed since the Facility was first operational in 2012. Section 6.0 demonstrates how the proposed changes are consistent with the Council's previous findings.

3.3 Location of the Proposed Change – OAR 345-027-0060(1)(b)(C) and Associated Analysis Areas

OAR 345-027-0060(1)(b)(C) the specific location of the proposed change, and any updated maps and/or geospatial data layers relevant to the proposed change

Figure 1 shows the Facility location, and Figure 2 shows the facility turbines and other infrastructure. Figure 3 provides the analysis areas reviewed in RFA 2 in consideration of OAR 345-001-0010(59).

No turbine relocations are proposed, and all existing as-built maps remain in effect. There would be no new permanent impact areas. Temporary impacts associated with the upgrading activities will be within the previously approved temporary impact areas for Facility construction. As noted in Section 1.0, the temporary impacts associated with the Facility upgrade would be smaller in area and shallower in depths of disturbance than for Facility construction because the Facility infrastructure is already established and will be used to the maximum amount practicable. There will be approximately 125 acres of temporary impact, less than 40 percent of the maximum approved temporary impacts in RFA 1 (ODOE 2010: 28). Figure 4 shows the anticipated limits of temporary impact areas.

4.0 Division 21 Requirements – OAR 345-027-0060(1)(c)

OAR 345-027-0060(1)(c) References to any specific Division 21 information that may be required for the Department to make its findings.

4.1 Required Permits – OAR 345-021-0010(1)(e)

The Certificate Holder will ensure all other necessary federal, state and local permits or approvals required for upgrading will be obtained prior to upgrading activities consistent with Condition 27, which will be documented through annual reporting. The Certificate Holder has submitted and received updated Notice of Proposed Construction or Alteration to the Federal Aviation Administration for the turbine specification changes (Condition 27)[2]. A National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge General Permit 1200-C (Condition 73) will be obtained, if necessary. No other permits will be required; however, the Certificate

[2] The Federal Aviation Administration (FAA) is the responsible government agency for determining whether any turbine tower presents a hazard to aviation, including military aviation.

Holder will coordinate with the local jurisdiction, as necessary, prior to and during upgrading such as for use of county roads (Conditions 66 and 67).

4.2 Additional Statutes and Rules – OAR 345-021-0010(cc)

There are no additional statutes and rules that are applicable to RFA 2.

5.0 Site Certificate Revisions – OAR 345-027-0060(1)(d)

OAR 345-027-0060(1)(d) The specific language of the site certificate, including conditions, that the Certificate Holder proposes to change, add or delete through the amendment.

The Certificate Holder proposes to modify the specific language of Site Certificate Condition 26 as shown below and in Attachment 1. No other language in the Site Certificate is proposed to be changed as part of RFA 2.

26. The Certificate Holder shall construct a Facility substantially as described in the Site Certificate and may select turbines of any type, subject to the following restrictions and compliance with all other Site Certificate conditions. Before beginning construction, the Certificate Holder shall provide to ODOE a description of the turbine types selected for the Facility demonstrating compliance with this condition.

a. The total number of turbines at the Facility must not exceed 116 turbines.

b. The combined peak generating capacity of the Facility must not exceed 290 megawatts.

c. The turbine hub height must not exceed 105 meters and the maximum blade tip height must not exceed 150 meters. The minimum blade tip clearance must be 251.5 meters above ground.

d. The maximum volume of concrete above three feet below grade in the turbine foundations must not exceed 66 cubic yards.

e. The maximum combined weight of metals in the tower (including ladders and platforms) and nacelle must not exceed 393 U.S. tons per turbine.

f. The Certificate Holder shall request an amendment of the Site Certificate to increase the combined peak generating capacity of the Facility beyond 290 megawatts, to increase the number of wind turbines to more than 116 wind turbines or to install wind turbines with a hub height greater than 105 meters, a blade tip height greater than 150 meters or a blade tip clearance less than 25meters above ground.

6.0 Division 22 Standards and Applicable Laws OAR 345-027-0060(1)(e)

OAR 345-027-0060(1)(e) A list of the Council standards and all other laws - including statutes, rules and ordinances - applicable to the proposed change, and an analysis of whether the facility,

with the proposed change, would comply with those applicable laws and Council standards. For the purpose of this rule, a law or Council standard is "applicable" if the Council would apply or consider the law or Council standard under OAR 345-027-0075(2).

Council standards relevant to RFA 2 include Division 22 (General Standards for Siting Facilities) and Division 24 (Specific Standards for Siting Facilities). Division 23, which applies to non-generating facilities, does not apply to wind power generating facilities. Similarly, inapplicable provisions of Division 24 (e.g., standards applicable to gas plants, gas storage, non-generating facilities) are not discussed in RFA 2. The upgrades to the Facility do not alter the Certificate Holder's ability to comply with the Council's earlier findings in the Final Order on the ASC and Amendment 1.

The primary purpose of RFA 2 is to take advantage of technological advances in the efficiency of wind resource harvesting. The Site Boundary would not be changed and there would be no changes to the Facility's approved permanent and temporary impact footprint. Table 2 identifies Council standards and other laws that were reviewed as part of RFA 2, and their applicability to the proposed change. Table 2 also identifies the conditions applicable to the operational phase of the Facility. Ultimately, the Facility would be operated in the same manner as previously approved by the Council, which imposed conditions, as necessary, for Facility operations. Except as specifically proposed in Section 5.0 of this RFA, the Certificate Holder will continue to comply with all existing Site Certificate conditions, as documented through annual reporting.

Table 2. Laws Relevant to Proposed Amendment

Standard	Applicability	Conditions Applicable to RFA 2
OAR 345-022-0000 General Standard of Review	Applicable and complies.	(3) Design, construct and operation Facility in compliance with Site Certificate, Council rules and other permits.
OAR 345-022-0010 Organizational Expertise	Applicable and complies. There is no proposed change to the Certificate Holder who has been operating the Facility for 7 years in accordance with applicable Site Certificate conditions. The Certificate Holder has many years of experience operating energy projects and GE Renewable Energy has performed over 2,500 repowering upgrades across the US. See Section 6.2 for accompanying analysis.	N/A

Standard	Applicability	Conditions Applicable to RFA 2
OAR 345-022-0020 Structural Standard	Applicable and complies. See Section 2.3 which includes updated information regarding engineering studies and climate change.	(62) Inspect turbine and turbine tower components on a regular basis; maintain and repair as necessary.
OAR 345-022-0022 Soil Protection	Applicable and complies. There would be no change to the Facility footprint and no permanent surface disturbance. The proposed changes do not modify the basis for the Council's previous findings for soil protection.	(50) Handling of hazardous materials (51) Hazardous material spill cleanup (77) Restore temporarily disturbed areas
OAR 345-022-0030 Land Use	Applicable and complies. There would be no change to the Facility footprint and all setbacks would still be met, therefore the proposed changes would not impact farm or ranch use in the area.	(11) Vegetation restoration (36) Landowner consultation (37) Minimize land disturbance (38) Noxious weed control plan (40) Setback requirements (73) Erosion and Sediment Control Plan (75) Construction dust abatement (76) Reduction of temporary disturbance impacts (84) Revegetation plan
OAR 345-022-0040 Protected Areas	Applicable and complies. The proposed change does not modify the basis for the Council's previous finding for protected areas.	(93) Visual impact minimization (95) Exterior nighttime lighting
OAR 345-022-0050 Retirement and Financial Assurance	Applicable and complies. With the proposed change, the Certificate Holder is still able to restore the site to a useful, nonhazardous condition following permanent cessation of construction or operation of the Facility.	(7) Prevent development on site that would preclude restoration. (8) Maintain a bond or letter of credit until facility retirement (30) Adjust the amount of bond or letter of credit on an annual basis

Standard	Applicability	Conditions Applicable to RFA 2
OAR 345-022-0060 Fish and Wildlife Habitat	Applicable and complies. Proposed change would be within existing Site Boundary in areas surveyed for fish and wildlife habitat.	(77) Restore temporarily disturbed areas (83) Wildlife Monitoring and Mitigation Plan (84) Revegetation Plan (85) Habitat Mitigation Plan within habitat mitigation area (89) May not remove any trees greater than three feet in height (92) Five mile per hour speed limit within 1000 feet of WAGS habitat; 20 mile per hour speed limit on Facility roads
OAR 345-022-0070 Threatened and Endangered Species	Applicable and complies. The Facility would be constructed within the approved Site Boundary where impacts to T&E species have already been reviewed.	(83) Wildlife Monitoring and Mitigation Plan (92) Five mile per hour speed limit within 1000 feet of WAGS habitat; 20 mile per hour speed limit on Facility roads
OAR 345-022-0080 Scenic Resources	Applicable and complies. The proposed change does not modify the basis for the Council's previous finding for Scenic Areas.	(93) Visual impact minimization (95) Exterior nighttime lighting
OAR 345-022-0090 Historic, Cultural and Archaeological Resources	Applicable and complies. Identified resources would be protected per applicable conditions.	(43) Final design map (45) Work cease due to historical find (46) Oregon Trail buffers
OAR 345-022-0100 Recreation	Applicable and complies. The proposed change does not modify the basis for the Council's previous finding for recreation areas.	N/A

Standard	Applicability	Conditions Applicable to RFA 2
OAR 345-022-0110 Public Services	Applicable and complies. Existing conditions apply to the Facility, which would be complied with for this RFA.	(27) Required permits (52) Construction fire training (53) Operation annual fire training (54) Fire prevention equipment (55) Fire safety plans (56) Site plan to fire protection agencies (66) Construction traffic impact measures (67) County road repair (68) Construction site health and safety plan (69) Operation site health and safety plan (70) Onsite security and communication with law enforcement (73) Erosion and Sediment Control Plan (75) Construction dust abatement (78) Operation onsite water compliance (100) Operation sanitary wastewater compliance
OAR 345-022-0120 Waste Minimization	Applicable and complies. The proposed change is not anticipated to increase the amount of solid waste and wastewater generated by the Facility.	(50) Handling of hazardous materials (51) Hazardous material spill cleanup (100) Discharge of sanitary wastewater (101) Construction waste management plan requirements (102) Operation waste management plan requirements
OAR 345-024-0010 Public Health and Safety Standards for Wind Energy Facilities	Applicable and complies. The proposed turbine modifications would result in a lower maximum blade tip height and a higher minimum blade tip clearance than other facilities currently approved by the Council. No new conditions are proposed for operations and upgrading.	(53) Annual fire training (54) Fire prevention equipment (55) Fire safety plans (56) Site plan to fire protection agencies (57) FAA Notice of Proposed Alteration (58) Maintenance of turbine pads (59) Manufactures' handling procedures (60) Maintenance of self-monitoring devices (61) Locked turbine access doors (62) Operational safety-monitoring program (64) Enclosure and locking of substation (71) Notification of accidents and mechanical failures (81) Transmission line maintenance (93) Visual impact minimization (95) Exterior nighttime lighting

Standard	Applicability	Conditions Applicable to RFA 2
OAR 345-024-0015 Siting Standards for Wind Energy Facilities	Applicable and complies. The Facility is operational with existing infrastructure. The proposed changes are being designed in consideration of cumulative adverse environmental effects.	(58) Maintenance of turbine pads (86) Disturbance avoidance areas (93) Visual impact minimization (95) Exterior nighttime lighting
OAR 345-024-0090 Transmission Lines	Not Applicable. There would be no changes to the transmission line as part of this Amendment Determination Request.	N/A
OAR 340-035-0035 Noise	Applicable and complies.	(96) Construction equipment noise (97) Noise compliance (98) Noise complaint response system
Removal-Fill Law	Applicable and complies.	N/A
Water Rights	Applicable and complies.	(78) Operation water usage

6.1 General Standard of Review – OAR 345-022-0000

(1) To issue a site certificate for a proposed facility or to amend a site certificate, the Council shall determine that the preponderance of evidence on the record supports the following conclusions:

(a) The facility complies with the requirements of the Oregon Energy Facility Siting statutes, ORS 469.300 to 469.570 and 469.590 to 469.619, and the standards adopted by the Council pursuant to 469.501 or the overall public benefits of the facility outweigh any adverse effects on a resource or interest protected by the applicable standards the facility does not meet as described in section (2);

(b) Except as provided in OAR 345-022-0030 for land use compliance and except for those statutes and rules for which the decision on compliance has been delegated by the federal government to a state agency other than the Council, the facility complies with all other Oregon statutes and administrative rules identified in the project order, as amended, as applicable to the issuance of a site certificate for the proposed facility. If the Council finds that applicable Oregon statutes and rules, other than those involving federally delegated programs, would impose conflicting requirements, the Council shall resolve the conflict consistent with the public interest. In resolving the conflict, the Council cannot waive any applicable state statute.

….

(4) In making determinations regarding compliance with statutes, rules and ordinances normally administered by other agencies or compliance with requirements of the Council statutes if other agencies have special expertise, the Department of Energy shall consult with such other agencies during the notice of intent, site certificate application and site certificate amendment processes. Nothing in these rules is intended to interfere with the state's implementation of programs delegated to it by the federal government.

The Council previously found that the Facility complies with the General Standard of Review (ODOE 2008, ODOE 2010). For RFA 2, the requirements of OAR 345-022-0000 are addressed in the findings, analysis, and conclusions discussed in the following sections. As detailed in the following sections, RFA 2 meets all applicable standards and the Council can continue to find that the requirements of OAR 345-022-0000 are met.

Oregon's Renewable Portfolio Standard (RPS) establishes a requirement for how much of Oregon's electricity must come from renewable resources like solar. The current RPS is set at 50 percent by 2040. In addition to Oregon's RPS, private companies have their own renewable energy procurement policies, which increase the demand for renewable energy in Oregon. These public and private policies are intended to reduce greenhouse gas emissions, mitigate climate impact, and reduce reliance on carbon-based fuels. Wind generation and wind upgrading or repowering projects, like this upgrade to the Facility provide for future optimized, consistent energy output to help further these policies. In addition, a mission of Oregon's Climate Action Plan is to achieve a reduction in greenhouse gas emissions levels to at least 45 percent below 1990 emissions levels by

2035, and at least 80 percent below 1990 emissions levels by 2050. The Facility upgrade will contribute to the reduction of greenhouse gas emissions.

Caithness maintains a strong presence in the local community and thereby provides a positive economic impact and public benefit. For the entire Shepherds Flat Wind Farm, there are over 50 direct jobs on site, with over 30 personnel living in-state. The Shepherds Flat Wind Farm provides approximately $40 million of capital annually to the local community, between lease payments to landowners and property taxes. In addition, Caithness maintains a strong alliance with Columbia Gorge Community College, provides donations to local events and charities, and are active partners to local fire and police personnel. On balance, the Council may find that proposed change in RFA 2 promotes Oregon energy policy and provides a net public benefit, and may conclude that the Facility, as modified by RFA 2, continues to comply with the General Standard.

6.2 Organizational Expertise – OAR 345-022-0010

(1) To issue a site certificate, the Council must find that the applicant has the organizational expertise to construct, operate and retire the proposed facility in compliance with Council standards and conditions of the site certificate. To conclude that the applicant has this expertise, the Council must find that the applicant has demonstrated the ability to design, construct and operate the proposed facility in compliance with site certificate conditions and in a manner that protects public health and safety and has demonstrated the ability to restore the site to a useful, non-hazardous condition. The Council may consider the applicant's experience, the applicant's access to technical expertise and the applicant's past performance in constructing, operating and retiring other facilities, including, but not limited to, the number and severity of regulatory citations issued to the applicant.

(2) The Council may base its findings under section (1) on a rebuttable presumption that an applicant has organizational, managerial and technical expertise, if the applicant has an ISO 9000 or ISO 14000 certified program and proposes to design, construct and operate the facility according to that program.

(3) If the applicant does not itself obtain a state or local government permit or approval for which the Council would ordinarily determine compliance but instead relies on a permit or approval issued to a third party, the Council, to issue a site certificate, must find that the third party has, or has a reasonable likelihood of obtaining, the necessary permit or approval, and that the applicant has, or has a reasonable likelihood of entering into, a contractual or other arrangement with the third party for access to the resource or service secured by that permit or approval.

(4) If the applicant relies on a permit or approval issued to a third party and the third party does not have the necessary permit or approval at the time the Council issues the site certificate, the Council may issue the site certificate subject to the condition that the Certificate Holder shall not commence construction or operation as appropriate until the third party has obtained the necessary permit or approval and the applicant has a contract or other arrangement for access to the resource or service secured by that permit or approval.

The Council previously found that the Certificate Holder, as a subsidiary of Caithness, has the organizational expertise to construct, operate and retire the proposed Facility in compliance with Council standards and conditions of the Site Certificate (ODOE 2008, ODOE 2009, ODOE 2010). This finding was based on a review of qualifications of Caithness personnel who would be responsible for the construction and operation of the Facility. There has been no change to Caithness' ownership, management, or holdings that would alter the previous conclusion.

Caithness has engaged in the permitting, design, and construction of energy facilities throughout the United States, including Shepherds Flat Wind Farm, and has specialized in power plant development, operations, and asset management. Caithness' efforts have resulted in a portfolio of some of the premier energy projects in the United States, making Caithness one of the largest privately held independent power producers. Caithness and its wind energy subsidiaries have not received any regulatory citations in the course of constructing and operating wind energy facilities. Caithness has direct and relevant experience to perform upgrading tasks at the Facility through its experience in wind farm site development, wind farm O&M activities, and staff wind farm repower experience. Caithness has experience developing and selling wind assets which required much larger construction activities than repowering. The Shepherds Flat site management team also has industry experience in full repower construction, that is replacing all turbine components including towers with new components. The upgrade proposed in this request is a partial turbine repower. A partial repower solely replaces the turbine blades and associated components, a practice that is relatively new to the renewable energy industry. The Facility is currently operational, and part of routine O&M of wind facilities is turbine component replacement including blades and nacelles. Therefore, Caithness has experience in turbine repowering tasks and actions including wind tower repower, blade and nacelle replacement, and associated construction activities.

Caithness has been collaborating with GE Renewables for this potential upgrade of turbine hardware. GE Renewables has completed over 2,500 repowering upgrades, covering 4 gigawatts of capacity at 36 different wind farms across the United States since 2017, and has a global installed base of over 60 gigawatts. GE Renewables anticipates repowering an additional 3 gigawatts of units for 11 customers at over 25 new wind farms by the end of 2020. On average, wind turbines repowered by GE Renewables have seen a 20 percent increase in annual energy production and 1.5 percent availability improvement from pre-repower performance. GE Renewables has the engineering, design, and financing expertise to enable developers to generate the maximum amount of clean, renewable energy in the most economic manner possible.

Third-party permits are not anticipated, since no new construction will be required for the upgrades. There are no circumstances that would alter the basis for the Council's earlier findings. Therefore, the Council may rely on its previous findings that the Certificate Holder continues to have the organizational expertise to construct, operate, and retire the Facility in compliance with Council standards and Site Certificate conditions.

6.3 Structural Standard – OAR 345-022-0020

(1) Except for facilities described in sections (2) and (3), to issue a site certificate, the Council must find that:

(a) The applicant, through appropriate site-specific study, has adequately characterized the seismic hazard risk of the site; and

(b) The applicant can design, engineer, and construct the facility to avoid dangers to human safety and the environment presented by seismic hazards affecting the site, as identified in subsection (1)(a);

(c) The applicant, through appropriate site-specific study, has adequately characterized the potential geological and soils hazards of the site and its vicinity that could, in the absence of a seismic event, adversely affect, or be aggravated by, the construction and operation of the proposed facility; and

(d) The applicant can design, engineer and construct the facility to avoid dangers to human safety and the environment presented by the hazards identified in subsection (c).

(2) The Council may not impose the Structural Standard in section (1) to approve or deny an application for an energy facility that would produce power from wind, solar or geothermal energy. However, the Council may, to the extent it determines appropriate, apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

(3) The Council may not impose the Structural Standard in section (1) to deny an application for a special criteria facility under OAR 345-015-0310. However, the Council may, to the extent it determines appropriate, apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

The Council previously found that the Certificate Holder has met the Structural Standard through compliance with Council standards and conditions of the Site Certificate (ODOE 2008, ODOE 2009, ODOE 2010). Prior to construction of the Facility, the Certificate Holder adequately characterized the seismic hazard risk of the site through an appropriate site-specific study (Site Certificate Condition 47), and had designed, engineered, and constructed the Facility in accordance with the requirements set forth by the State of Oregon's Building Code Division, as well as all other applicable codes and design procedures, to meet or exceed the minimum standards required by the 2003 International Building Code (Site Certificate Condition 48). In addition, the Certificate Holder met Site Certificate Condition 49 by designing, engineering, and constructing the Facility to avoid dangers to human safety presented by non-seismic hazards. Temporary disturbance will be entirely in areas that were previously temporarily and permanently disturbed as part of Facility construction, and which were studied in the previous site-specific geotechnical investigations.

Consultation with the Oregon Department of Geology and Mineral Industries (DOGAMI) was initiated through ODOE and conducted on August 20, 2019. The DOGAMI consultation notes are included as Attachment 2. During consultation, DOGAMI requested information on how seismic

ground motions that exceed the building code response spectrum will be addressed and requested disaster resilience and future climate change be addressed, which are provided below.

Seismic consideration was based on Site Class D as determined in the geotechnical report conducted for the Shepherds Flat Central Phase (Renewable Resources Consultants, LLC 2009) and on the current 2014 Oregon Structural Specialty Code, which relies on American Society for Civil Engineers (ASCE) publication 7-10. The seismic ground acceleration factors (Ss and S1) for turbine T-514 and T-604 are 0.426 and 0.171 and 0.418 and 0.166, respectively (see Attachment 3). During consultation with DOGAMI, it was requested that seismic ground motions that exceed the building code response spectrum are addressed. Subsequently, an analysis was conducted to look at seismic parameters for ASCE 7-16 using coordinates for turbines T-514 and T-604. The ASCE 7-16 analysis shows Ss and S1 are 0.405 and 0.166 and 0.399 and 0.162, respectively, which is a slight decrease from ASCE 7-10 (see Attachment 3). Although highly unlikely given the lack of recent activity, potential sources of long-period ground motions could include a significant event at or near faults associated with the Arlington-Shulter Butte faults and Columbia Hills structure as identified in the 2007 Seismic Hazard Assessment conducted as part of the original site certificate application (Shannon & Wilson, Inc. 2007). Given adequate seismic design as described above, potential impacts of long-period ground motions on very tall structures proposed with the facility are not expected.

The Certificate Holder will conduct a foundation uprate analysis on turbines within the Facility to review the original foundation calculations with the new loading documents to verify whether the existing turbine foundations can support the newly proposed loading. The foundation upgrade or uprate analysis for RFA 2 will be conducted in a similar manner as to that which was completed for the Shepherds Flat Central RFA 2 (Demo Units) that was approved by Council on October 25, 2019. The upgrade foundation analysis will be for all turbines being upgraded. The evaluation will be conducted by a licensed engineer using current code requirements and state-of-practice methods and will be provided to ODOE and DOGAMI. Current code and resources that will be used for the upgrade analysis include the 2019 Oregon Structural Specialty Code (which relies on ASCE publication 7-16 and portions of the 2018 International Building Code, the 2018 International Fire Code and other nationally adopted codes), the ASCE/American Wind Energy Association Recommended Practice for Compliance of Large Land-based Wind Turbine Support Structures, and DNV GL-ST-C502 Offshore Concrete Structures standard. The analysis will be performed for approximately 8 years of existing operational service for the longer turbine blades, plus 20 years of additional operation time after the upgraded turbines are put into service. The loads will be used to perform all of the design checks according to current industry standards using the existing foundation design. The findings and analysis of the upgrade analysis will be reviewed by the Caithness engineering staff. Mitigation and remediation measures are not anticipated because annual foundation inspections have not identified any turbine foundation issues. If, in the unlikely event remediation measures are necessary, remediation measures and timing recommendations in the foundation uprate analysis will be implemented.

Prior to the upgrade, approximately five turbine foundations on the Shepherds Flat Wind Farm will receive a more thorough inspection in anticipation of the upgrade. The inspection will involve pulling back soil to assess areas of the foundation that are typically not visible. This exercise is a conservative and precautionary due diligence measure; it is not anticipated that this additional physical inspection will result in any additional remediation needs at the Facility. However, similar to the findings of the foundation uprate analysis, the Certificate Holder will follow any remediation recommendations provided from the inspection.

The Certificate Holder will continue to inspect all turbine and turbine tower components on a regular basis and maintain or repair turbine and turbine tower components as necessary in compliance with Site Certificate Condition 62.

The regular turbine and tower component inspection process will not change as a result of the repowering project because the turbine components and how they function will generally stay the same. However, the annual inspection process and procedures will ”restart” as if the Facility is new rather than having been operational for 8 years. Therefore, the turbines will undergo the same and more rigorous inspections of a new facility, which will start with a full inspection of all turbines and turbine components within 6 months of being upgraded. After the 6-month inspection, the Facility will be in the typical annual inspection process. The regular inspections include turbine anchor bolt checks, starting with all turbine anchor bolts, then based on those results, only a certain percentage of turbine anchor bolts will be checked. Typically, the industry standard is 10 percent of turbines. There is also a visual inspection of the outside of the foundation for damage and cracks and gearbox checks. Additionally, the Supervisory Control and Data Acquisition system provides 24/7, real-time monitoring and control for every turbine for potential maintenance needs. Because there will be no change to the inspection process and procedures that have been in effect for the Facility since it began operation 8 years ago other than an additional inspection at 6-months after repowering. The Certificate Holder proposes the following below change to Site Certificate Condition 62:

The certificate holder shall have an operational safety-monitoring program and shall inspect all turbine and turbine tower components on a regular basis. All turbine and turbine tower components will be inspected within 6 months of being repowered. The certificate holder shall maintain or repair turbine and turbine tower components as necessary to protect public safety.

The information requested for an ASC to address the Structural Standard has been revised since the time the Site Certificate was issued (OAR 345-021-0010(h)). Although the OAR-345-022-0020 standard itself has not been substantively modified, the Certificate Holder provides information below to address two new areas of concern requested for Exhibit H of new applications: disaster resilience and climate change impacts. The Facility has been in operation for 8 years. During that time, climate change has not impacted the Facility. Future climate conditions, which may include greater-intensity rainfall events, fluctuations in typical annual snowpack (above or below normal), and warmer average annual temperatures, are also not anticipated to have a major impact on the geologic, geotechnical, and seismic conditions at the Facility. Sea level rise will not affect the Facility due to its location. The Facility’s design accounts for future climate extremes during its projected lifespan. To provide disaster resiliency, the Certificate Holder has designed the repower to current

code, as noted above, and taken into consideration seismic ground motions that exceed the building code response spectrum.

The Certificate Holder contracts with GE Renewables to perform O&M at the Facility. GE maintains an Emergency Preparedness and Fire Prevention Plan (see Attachment 4[3]) for the Facility that is updated annually. The Plan outlines the procedures to effectively respond to lightening and high winds, icing on blades or external equipment, cold weather work, and Emergency Medical Service coordination including on-site safety requirements and communication protocols. In addition, GE maintains instructions on how to respond to a significant event in an internal technical document titled "Access and Evaluation of WTG after a Significant Event (Blade Collapse, Turbine Over Speed, Tower Damage)." While it is hard to predict all future climatic conditions, current codes and design specifications are continuously evolving and go through annual technical reviews to ensure they are current to the latest technology and means and methods for renewable energy facilities. See Section 6.1 above for additional discussion on how the facility may help minimize the impacts of climate change. Based on this updated information and analysis, the Council may conclude that the Facility, as modified by RFA 2, continues to comply with the Structural Standard.

6.4 Soil Protection – OAR 345-022-0022

To issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are not likely to result in a significant adverse impact to soils including, but not limited to, erosion and chemical factors such as salt deposition from cooling towers, land application of liquid effluent, and chemical spills.

The Council previously found that the Certificate Holder has demonstrated an ability to construct, operate, and retire the Facility in compliance with Council standards and conditions of the Site Certificate (ODOE 2008, ODOE 2009). Exhibit I of the ASC identified the soil conditions and land uses in accordance with the submittal requirements in OAR 345-021-0010 (1)(I) paragraphs (A) through (E). Upgrading the Facility will cause temporary disturbance entirely in areas that were previously temporarily and permanently disturbed as part of Facility construction. However, temporary disturbance from upgrading will be substantially less in area and depths compared to Facility construction (See Section 3.0). Most temporary disturbance will occur along the Facility roads where the cranes will move turbine components. The Certificate Holder would minimize temporary disturbance by making use of previously disturbed areas, including roadways and turbine pads. To protect existing plant cover during construction, the Certificate Holder would avoid scraping vegetation from areas of temporary disturbance (Condition 76). By crushing – rather than scraping – vegetation, the Certificate Holder would preserve viable rootstalks. The Certificate Holder would implement best management practices (BMPs) to control any dust that is generated by upgrading activities, such as applying water to roads and disturbed soil areas

[3] By email confirmation from GE, it was confirmed that documents provided to support the permitting process do not need to be handled confidentially. However, the document is proprietary and cannot be copied without written consent from GE.

(Condition 75). Once the crane is removed from the site, the temporary, superficial disturbance will be revegetated according to Condition 77 and 84, as is routinely done as part of O&M activities.

All work conducted at the site during Facility construction followed requirements of the Erosion and Sediment Control Plan and the National Pollutant Discharge Elimination System (NPDES) 1200-C permit as required by Site Certificate Condition 73 and as reviewed by ODOE through construction and annual reporting (Condition 21). As noted above, upgrading the Facility will have fewer temporary impacts than Facility construction both in area and depth of ground disturbance. Although there will be approximately 109 acres of temporary impacts, as noted above, not all will be disturbance causing areas of bare soil. Upgrading activities will primarily occur on or along roadways and turbine pads. Vegetation will be temporarily disturbed by a single crane track and semi-trucks as they briefly drive over vegetation, or the placement of replacement components around the turbines. However, grading or earth disturbing activities will be needed for some turning radiuses. There could also be some additional spots of earth disturbing activities, primarily along access roads. Therefore, it is anticipated that there will be roughly 15 acres of earth disturbing activities. The Certificate Holder will comply with Site Certificate Condition 73, NPDES 1200-C, based on the final temporary earth disturbance areas for Facility upgrading. Regardless if a NPDES 1200-C is required, local, county, and state erosion control standards and erosion control BMPs will be followed, as pertinent, to the upgrading activities. Erosion control BMPs may include the following, which would be incorporated into the NPDES 1200-C, if applicable:

- Silt Fencing: Silt fencing may be installed around the perimeter of material stockpiles and construction staging areas.
- Straw Wattles: Straw wattles may be installed to decrease the velocity of sheet flow stormwater along the downgradient edge of Facility access roads adjacent to gullies or sensitive habitats.
- Mulching: Mulch may be provided to immediately stabilize soil exposed as a result of land disturbing activities and during the reseeding of disturbed areas.
- Stabilization Matting: Jute matting, straw matting, or turf reinforcement matting may be used to stabilize areas that could become exposed during installation of Facility access roads.
- Soil Binders and Tackifiers: Soil binders and tackifiers may be used on exposed areas to stabilize them until vegetation is established.
- Pollutant Management: During construction, source control measures will be implemented to reduce the potential of chemical pollution to surface water or groundwater during construction. Fuels and oils will be stored in a dedicated area, and construction vehicles will be fueled and maintained only in dedicated areas.

During the Facility upgrade, potentially hazardous materials that could be used include lubricating oils. As with other O&M activities that are conducted at the Facility, the Certificate Holder will continue to follow Site Certificate Condition 50 to handle hazardous materials present on site in a

manner that protects public health, safety, and the environment, and comply with all applicable environmental laws and regulations. Site Certificate Condition 51 will continue to be followed if an accidental spill or release were to occur, and spill kits will continue to be kept on site.

The proposed change in this RFA does not affect the basis for the Council's previous findings of compliance with the Soil Protection Standard because the Facility upgrade will occur within the previously approved and disturbed (during construction) Facility footprint and disturbance will be minor in comparison to Facility construction. The Facility must still comply with the Soil Protection Conditions previously imposed on the Facility (as discussed above) as they relate to upgrading. The Facility is already constructed, and the Certificate Holder has met all pre-construction and construction conditions, and continues to meet operational conditions as documented in annual reporting. Therefore, the Council may conclude that the Facility, as modified by RFA 2, continues to comply with the Soil Protection Standard.

6.5 Land Use – OAR 345-022-0030

(1) To issue a site certificate, the Council must find that the proposed facility complies with the statewide planning goals adopted by the Land Conservation and Development Commission.

(2) The Council shall find that a proposed facility complies with section (1) if:

(a) The applicant elects to obtain local land use approvals under ORS 469.504(1)(a) and the Council finds that the facility has received local land use approval under the acknowledged comprehensive plan and land use regulations of the affected local government; or

(b) The applicant elects to obtain a Council determination under ORS 469.504(1)(b) and the Council determines that:

(A) The proposed facility complies with applicable substantive criteria as described in section (3) and the facility complies with any Land Conservation and Development Commission administrative rules and goals and any land use statutes directly applicable to the facility under ORS 197.646(3);

(B) For a proposed facility that does not comply with one or more of the applicable substantive criteria as described in section (3), the facility otherwise complies with the statewide planning goals or an exception to any applicable statewide planning goal is justified under section (4); or

(C) For a proposed facility that the Council decides, under sections (3) or (6), to evaluate against the statewide planning goals, the proposed facility complies with the applicable statewide planning goals or that an exception to any applicable statewide planning goal is justified under section (4).

(3) As used in this rule, the "applicable substantive criteria" are criteria from the affected local government's acknowledged comprehensive plan and land use ordinances that are required by the statewide planning goals and that are in effect on the date the applicant submits the application. If the special advisory group recommends applicable substantive criteria, as described under OAR

345-021-0050, the Council shall apply them. If the special advisory group does not recommend applicable substantive criteria, the Council shall decide either to make its own determination of the applicable substantive criteria and apply them or to evaluate the proposed facility against the statewide planning goals.

(4) The Council may find goal compliance for a proposed facility that does not otherwise comply with one or more statewide planning goals by taking an exception to the applicable goal. Notwithstanding the requirements of ORS 197.732, the statewide planning goal pertaining to the exception process or any rules of the Land Conservation and Development Commission pertaining to the exception process, the Council may take an exception to a goal if the Council finds:

(a) The land subject to the exception is physically developed to the extent that the land is no longer available for uses allowed by the applicable goal;

(b) The land subject to the exception is irrevocably committed as described by the rules of the Land Conservation and Development Commission to uses not allowed by the applicable goal because existing adjacent uses and other relevant factors make uses allowed by the applicable goal impracticable; or

(c) The following standards are met:

(A) Reasons justify why the state policy embodied in the applicable goal should not apply;

(B) The significant environmental, economic, social and energy consequences anticipated as a result of the proposed facility have been identified and adverse impacts will be mitigated in accordance with rules of the Council applicable to the siting of the proposed facility; and

(C) The proposed facility is compatible with other adjacent uses or will be made compatible through measures designed to reduce adverse impacts.

(5) If the Council finds that applicable substantive local criteria and applicable statutes and state administrative rules would impose conflicting requirements, the Council shall resolve the conflict consistent with the public interest. In resolving the conflict, the Council cannot waive any applicable state statute.

(6) If the special advisory group recommends applicable substantive criteria for an energy facility described in ORS 469.300(11)(a)(C) to (E) or for a related or supporting facility that does not pass through more than one local government jurisdiction or more than three zones in any one jurisdiction, the Council shall apply the criteria recommended by the special advisory group. If the special advisory group recommends applicable substantive criteria for an energy facility described in ORS 469.300(11)(a)(C) to (E) or a related or supporting facility that passes through more than one jurisdiction or more than three zones in any one jurisdiction, the Council shall review the recommended criteria and decide whether to evaluate the proposed facility against the applicable substantive criteria recommended by the special advisory group, against the statewide planning goals or against a combination of the applicable substantive criteria and statewide planning

goals. In making the decision, the Council shall consult with the special advisory group, and shall consider:

(a) The number of jurisdictions and zones in question;

(b) The degree to which the applicable substantive criteria reflect local government consideration of energy facilities in the planning process; and

(c) The level of consistence of the applicable substantive criteria from the various zones and jurisdictions.

Under OAR 345-021-0010(1)(k), an applicant must elect to address the Council's Land Use standard by obtaining local land use approvals under Oregon Revised Statutes (ORS) 469.504(1)(a), or by obtaining a Council determination under ORS 469.504(1)(b). The Certificate Holder elected to have the Council make the land use determination for the Facility under ORS 469.504(1)(b) and OAR 345-022-0030(2)(b) and the Council previously concluded that the Facility complied with the Land Use Standard (ODOE 2008, ODOE 2009, ODOE 2010).

In its evaluation of the Facility under the Land Use Standard (OAR 345-022-0030) in the Final Order on the ASC, and in the subsequent request for amendment, the Council considered the applicable, substantive criteria. This includes the Gilliam County Zoning and Land Development Ordinance (GCZO; adopted 1947 and amended through 2000; codified in 2005 and amended through 2017) and Morrow County Zoning Code (MCZO; adopted in 1980 and amended through 1985; amended and readopted through 2001). The GCZO and MCZO have not had changes to the applicable sections that would impact the Council's prior findings under the Land Use Standard. The changes to these documents either do not apply to the location or zoning of the Facility site, or to the land use classification of the Facility or the Facility improvements.[4] There have also been no changes to the underlying zoning, Exclusive Farm Use (EFU).

RFA 2 does not affect the Council's previous findings of compliance with the Land Use Standard, because the upgrades will occur to existing turbines within the previously approved and disturbed (during construction) Facility footprint and will not add any new facilities nor change how the Facility is operated. RFA 2 involves only the aspects of the Facility located within the previously disturbed construction area at the existing turbines; it does not include any other facilities including the transmission line. Therefore, the Certificate Holder addresses the Land Use Standard accordingly, and does not review the transmission line or features other than those identified in Section 1.

As stated in Article 7, Section 7.020(T)(7)(c)(2) of the GCZO, an amendment to the conditional use permit shall be required if the proposed Facility changes would:

[4] GCZO Amendments since RFA 1:

- Ordinance No. 2011-04; Effective Date November 2, 2011 – Amends the Comprehensive Plan and GCZLDO, which included a zone change from Exclusive Farm Use to Limited Industrial.
- Ordinance No. 2017-02; Effective Date May 3, 2017 – Adopts marijuana business regulations, pursuant to Oregon House Bill 3400.

(a) Increase the land area taken out of agricultural production by an additional 20 acres or more;

(b) Increase the land area taken out of agricultural production sufficiently to trigger taking a Goal 3 exception;

(c) Require an expansion of the established Facility boundaries;

(d) Increase the number of towers;

(e) Increase generator output by more than 25 percent relative to the generation capacity authorized by the initial permit due to the repowering or upgrading of power generation capacity.

Under RFA 2, the Facility will not require an amendment to its Conditional Use Permit for Gilliam County because this request does not seek to enlarge the existing Site Boundary or change the previously approved maximum number of turbines, maximum generating capacity, or infrastructure locations of the Facility. The proposed change will increase the blade length and the overall turbine height (proposed maximum height change from 135 to 150 meters) compared to the dimensions of the existing turbines installed at the Facility; however, the new height will remain lower than the previously approved maximum turbine height (150 meters) on which the original visual analysis was based. The upgrade will occur at existing turbines and will only impact land previously disturbed by construction of the Facility. RFA 2 will comply with all previous setback standards imposed through GCZO Sections 7.020, 4.020, and 7.010, MCZO Section 3.010, as well as Site Certificate Condition 40. Based on a setback analysis for the new height of the turbines, one turbine will not be able to meet the setbacks and therefore will not be upgraded.

MCZO does not provide clear parameters for when an amendment to a conditional use permit is required. However, because this is an existing Facility and the proposed modifications to the turbines are minimal, none is anticipated because the Facility can still meet all the conditions identified by Morrow County Special Advisory Group for the Facility as a conditional use in the EFU zone during review of the ASC (see Table 3; ODOE 2008). Likewise, Gilliam County conditional use conditions identified in the Final Order of the ASC will continue to be upheld through implementation of Site Certificate conditions (Table 4; ODOE 2008).

Table 3. Morrow County Conditional Use Permit Conditions

Subsection	Subject	Site Certificate Conditions	RFA 2 Applicability
Conditions imposed under MCZO Section 6.030			
A	Noise Dust control	97 65, 75, 92	97 75, 92
C	FAA notification Building permits	57 27	57 27
D	Road crossing permits (access permits) Road construction standards	27 65	27 Not applicable
E	Impact to County roads Emergency vehicle access	67 55, 56	67 55, 56

Subsection	Subject	Site Certificate Conditions	RFA 2 Applicability
G	Signs	93	93
K	Historical sites Post-construction reclamation	43 through 46 11, 84	43, 45, 46 11, 84
L	Perform consistent with application Decommissioning bond	3 8, 30	3 8, 30

Table 4. Gilliam County Conditional Use Permit Conditions

Subsection	Subject	Site Certificate Conditions	RFA 2 Applicability
Conditions Imposed under GCZO Section 7.010(A)(2)			
(a)	Noise Air pollution (dust control) Glare (lighting) Construction schedule Daylight hours Tv/radio/microwave interference Utility lines Advertising Visual impact	97 65, 75, 92 95 24, 25 96 Not applicable 82 93 93, 94	97 75, 92 95 Not applicable 96 Not applicable Not applicable 93 93
(b)	Setback	40	40
(c)	Turbine specifications	26	26
(d)	Highway access	27	27
(e)	Signs, lighting	93, 95	93, 95
(f)	Fencing, gates	42, 64	64
(g)	Wildlife Weed control Riparian areas	83 through 92 38 73, 77, 86	83 through 85, 89, 92 38 73, 77, 78
(h)	Periodic review	20, 21	Not applicable
(i)	Waste disposal Weed control Visual impact Fire protection Dust control Road repair	101, 102 38 93, 94 52 through 56 65, 75, 92 67	101, 102 38 93 52 through 56 75, 92 67
(j)	Inspection, periodic review	20, 21	Not applicable
Conditions Imposed under GCZO Section 7.020(T)(4)			
(b)	Compliance with laws Oregon department of aviation	3, 27 3, 27	3, 27 3, 27

Subsection	Subject	Site Certificate Conditions	RFA 2 Applicability
	Leases and easements	3	3
	Covenant not to sue	39	Not applicable
	Cost reimbursement for cup review	See Table Note 1	See Table Note 1
	Erosion and sediment control	73	73
	Tower access/safety	55, 61, 62	55, 61, 62
	Hazardous substances	50,51	50, 51
	Pesticides/herbicides	50	50
	Notification of accidents	71	71
	Notice to FAA	57	57
	Notice to adjacent residents	55	55
	Conformance with site plan	2, 3, 26, 29, 41	3, 26
	Hardware control and safety	26, 60	26, 60
	Interconnection	27	27
	Individual metering	60	60
	Tower identification	41, 93	93
	Notice of permit conditions	27, 33	27
	Field contact representative	34	Not applicable
	Facility enlargement/modification	1, 21, 26	1, 26
	Noncompliance/revocation	3	3
	Decommissioning	9, 16	9, 16
	Bond	8, 30	8, 30
	Archaeological discoveries	43 through 46	43, 45, 46
	Coordination with cultural groups	43, 45	43, 45
	Assignment and binding	15	Not applicable
	Avian impact monitoring	83	83
	City of Arlington airport	Not applicable	Not applicable

1. County fees are recoverable under ORS 469.360(1) and ORS 469.401(3) and (4).

No impacts or increased farming costs will occur because the Facility is already established and will continue to comply with the terms of the Site Certificate to mitigate on and off-site impacts. During upgrading activities affecting cultivated land, the Certificate Holder would consult with landowners and implement measures to avoid or reduce disruption of ongoing farming activities, including maintaining existing diversions and contour tillage patterns and using the minimum land area necessary (Conditions 36 and 37). Additionally, a weed control plan consistent with both Morrow and Gilliam County Weed Control Programs will be followed (Condition 38) and traffic impacts will be minimized by having a rolling construction schedule and additional measures such as having flaggers, as needed, on roads (Condition 66). Therefore, the proposed changes will not "force a

significant change in" the adjacent farming practices or "significantly increase the cost of"[5] an adjacent farming operation.

As described herein, the changes proposed in RFA 2 comply with all applicable substantive criteria. Therefore, the Council can find that the Facility complies with the statewide planning goals adopted by the Land Conservation and Development Commission. Additionally, the Facility will comply with Land Use conditions previously imposed on the Facility as they relate to the proposed changes (see Tables 2-4). For the reasons discussed above, the Council can find that, with approval of RFA 2, the Facility continues to comply with the Land Use Standard.

6.6 Protected Areas – OAR 345-022-0040

1) Except as provided in sections (2) and (3), the Council shall not issue a site certificate for a proposed facility located in the areas listed below. To issue a site certificate for a proposed facility located outside the areas listed below, the Council must find that, taking into account mitigation, the design, construction and operation of the facility are not likely to result in significant adverse impact to the areas listed below. References in this rule to protected areas designated under federal or state statutes or regulations are to the designations in effect as of May 11, 2007:

….

The Protected Areas Standard requires the Council to find that, taking into account mitigation, the design, construction, and operation of a facility are not likely to result in significant adverse impacts to any protected area as defined by OAR 345-022-0040. The Council previously found that the Shepherds Flat Wind Project was not located in any protected area listed in OAR 345-022-0040 (ODOE 2008). Six protected areas were located within 20 miles of the Facility, four of which were located over 17 miles from the Site Boundary: Umatilla National Wildlife Refuge, John Day State Scenic Waterway, John Day Federal Wild and Scenic River, and John Day River Wildlife Refuge; impacts were deemed negligible. The remaining two sites (within 2 miles of the Site Boundary) had potential for impact: Willow Creek Wildlife Area and the Horn Butte U.S. Bureau of Land Management (BLM) Area of Critical Environmental Concern (described in Exhibit L of the ASC (Caithness Shepherds Flat, LLC 2007: 72-75). The two sites were determined to have potential impacts from construction noise (Horn Butte has long-billed curlew nesting sites, which are a State Sensitive Vulnerable species) and visual impacts (Caithness Shepherds Flat, LLC 2007: 72-75). No other impacts were found to occur, including impacts from operation noise, construction or operation traffic, construction or operation water, construction or operation wastewater, or air emissions. The Council found that the design, construction, and operation of the Facility was not likely to result in significant adverse impact to any protected area (ODOE 2008, ODOE 2009, ODOE 2010). The Council did not impose any conditions related to this standard. The change proposed in RFA 2 does not alter the basis of this finding.

One new protected area within the analysis area has been added under OAR 345-022-0040 since the previous findings were reached: Cottonwood Canyon State Park. Additionally, all six of the

[5] ORS 215.296(1).

previously identified protected areas are within the 20-mile analysis area of the upgraded turbines (Figure 3). The change proposed in RFA 2 is not likely to result in significant adverse impacts to these protected areas. Upgrading activities will be short-term and construction noise impacts will be less than what was previously authorized for the Facility. The upgrades will increase the blade length and the overall turbine height (proposed maximum height change from 135 to 150 meters) compared to the dimensions of the existing turbines installed at the Facility; however, the new height will remain lower than the previously approved maximum turbine height (150 meters) on which the original visual analysis was based. Although the previous findings did not specifically consider potential impacts to Cottonwood Canyon State Park, they are nevertheless applicable to RFA 2 because of geographic circumstances. Cottonwood Canyon State Park is approximately 12 miles from the Facility and occupies a relatively short segment of the John Day River corridor that is within the State Scenic Waterway and Federal Wild and Scenic River designations. The previous analyses determined that the proposed Facility would not be visible from scenic viewpoints on the John Day River (which would include the John Day River within Cottonwood Canyon State Park) but that some turbines might be visible from higher elevations along the river canyon at distances of 17 miles or more. Based on the viewing distance and intervening features, the Council found that the Facility would not result in significant adverse impact to scenic resource values within the John Day River area. Cottonwood Canyon State Park is slightly closer, within 12 miles of the Site Boundary, but with ongoing visual mitigation enforced through Site Certificate Conditions 93 and 95, the presence of wind turbines is unlikely to interfere with views of the protected scenic resource. Therefore, RFA 2 will not alter the findings of the previous visual impact analysis, thus will not result in a new, adverse visual impact that was not previously evaluated by the Council.

RFA 2 will not exceed operation noise (see Section 6.17), construction or operation traffic (see Section 6.13), construction or operation water (see Section 6.19), construction or operation wastewater (see Section 6.13), or visual impacts from air emissions that were previously analyzed for the Facility (see Section 6.10). Traffic demands on local roads and well-developed adjacent highway network (I-84, OR 74, and OR 19) will be low because of the rolling upgrading schedule, and any effects during the turbine upgrades and operation are expected to be temporary and negligible (see Section 6.13), and will not adversely affect protected areas. Water use will most likely be supplied from the City of Arlington during the upgrade (see Attachment 5). Water required for the upgrade will be less than what was previously approved for Facility construction because water will not be needed for turbine foundations and there will be a smaller disturbance area therefore less water needed for dust control. This request does not seek to enlarge the existing Site Boundary, and there is no change to the previously approved maximum number of turbines, maximum generating capacity, turbine height or infrastructure locations of the Facility. Therefore, the proposed amendment makes no changes that would alter the basis for the Council's earlier findings, and the Council may find that this amendment request complies with OAR 345-022-0040.

6.7 Retirement and Financial Assurance – OAR 345-022-0050

To issue a site certificate, the Council must find that:

(1) The site, taking into account mitigation, can be restored adequately to a useful, non-hazardous condition following permanent cessation of construction or operation of the facility.

(2) The applicant has a reasonable likelihood of obtaining a bond or letter of credit in a form and amount satisfactory to the Council to restore the site to a useful, non-hazardous condition.

The Council previously found that the Facility, taking into account mitigation, could be restored adequately to a useful, non-hazardous condition following permanent cessation of construction or operation (ODOE 2010). In addition, the Certificate Holder has obtained a bond or letter of credit in a form that satisfies Site Certificate Condition 8, and will continue to adjust the amount of the bond or letter of credit on an annual basis per Site Certificate Condition 30.

It is anticipated that after updating the Facility, the Facility's useful life would be approximately 20 years. The Facility footprint will not change as part of RFA 2. Therefore, the specific actions and tasks to restore the site to a useful, non-hazardous condition are the same as was approved for RFA 1. Prior to the start of decommissioning, the Certificate Holder will submit a final retirement plan for Council approval, which will satisfy Condition (9) by describing the activities required to retire the site. After the Council approves the retirement plan, the Certificate Holder will obtain the necessary authorization from the appropriate regulatory agencies to proceed with restoration. The retirement plan would include, pursuant to OAR 345-027-0110(5), the following information:

5) In the proposed final retirement plan, the certificate holder shall include:

(a) A plan for retirement that provides for completion of retirement without significant delay and that protects public health, safety and the environment.

(b) A description of actions the certificate holder proposes to take to restore the site to a useful, non-hazardous condition, including information on how impacts to fish, wildlife and the environment would be minimized during the retirement process.

(c) A current detailed cost estimate and a plan for ensuring the availability of adequate funds for completion of retirement.

(d) An updated list of the owners of property located within or adjacent to the site of the facility, as described in OAR 345-021-0010(1)(f).

The total site restoration cost for the Facility was originally estimated at $9,108,000 (ODOE 2010) and has been updated annually since construction per Site Certificate Condition 30. Of this amount, approximately $4,106 was estimated per turbine for removal of hubs and blades by ODOE (2010). The removal of hubs and blades is per turbine. Since there will be no change to the number of turbines at the Facility, there is no change this estimate amount. Nacelles and towers are calculated per net ton of steel. There will be no new or changes to the towers. The weight of the new nacelle configuration will be approximately 6,000 kilograms less than the existing nacelle configuration.

The Certificate Holder will update the cost estimate at the time of the annual report compliance, as necessary, to reflect this decrease. RFA 2 does not propose any other changes that would change the total site restoration cost or how the site would be adequately restored to a useful, non-hazardous condition following permanent cessation of construction or operation than was previously approved by the Council. Based on the above information, the Council may find the standard contained in OAR 345-022-0050 is satisfied.

6.8 Fish and Wildlife Habitat – OAR 345-022-0060

To issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are consistent with:

(1) The general fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025(1) through (6) in effect as of February 24, 2017, and

(2) For energy facilities that impact sage-grouse habitat, the sage-grouse specific habitat mitigation requirements of the Greater Sage-Grouse Conservation Strategy for Oregon at OAR 635-415-0025(7) and OAR 635-140-0000 through -0025 in effect as of February 24, 2017.

The Council previously found that the design, construction, and operation of the initially proposed project (ODOE 2008), as well as each of the Shepherds Flat North, Shepherds Flat Central, and Shepherds Flat South facilities as described in RFA 1, would be consistent with ODFW's habitat mitigation goals and standards (OAR 635-415-0025). Based on these findings, and subject to the Site Certificate Conditions described in the ASC and RFA 1, the Council concluded that the Facility complies with the Council's Fish and Wildlife Habitat Standard.

6.8.1 Potential Impacts to Habitat

The changes to the Facility from RFA 2 will not result in additional habitat impacts; therefore, the Facility continues to satisfy the standard without need for additional habitat mitigation. The proposed increase in blade length at repowered turbines does not present the potential to disturb habitat while in operation. The extent of disturbance to vegetation will be temporary, limited to areas previously disturbed during construction, and smaller in area than for Facility construction. Facility-wide repowering is projected to be completed on a rolling schedule, over an approximately 7-month time frame, with typically 8-15 turbines being powered at a time. Repower activities at each turbine will occur over the course of approximately two weeks.

Work areas associated with the repowering process at the Facility are shown in Figure 4. Repowering is projected to occur in an approximately 125.2-acre area, primarily along the edges of Facility access roads (77.3 acres) and at turbine pads (39.4 acres), but also in the staging (5.1 acres) and turnaround areas (3.4 acres) shown in Figure 4. As requested by Steve Cherry (ODFW) on September 17, 2019, area calculations of habitat within the work areas are presented below with the available (pre-construction) habitat data as a reference. These areas were disturbed during construction; but may also have been disturbed following construction by conversion to other land uses (e.g., agriculture, gravel pit). Facility access roads have been excluded from both the figure and

the area calculations. Each pre-construction category and habitat type in this 125.2-acre area is provided in Table 5. Habitat categories and types are denoted in the same format as presented in the ASC and in RFA 1 for consistency (category number and abbreviated type), and these two documents provide detailed descriptions of these habitats (Caithness Shepherds Flat, LLC 2007, ODOE 2009). Some work areas occur in areas lacking pre-construction habitat data (Figure 4). These areas occur along existing Facility roads, were previously disturbed during construction, and have been categorized using aerial imagery; they are identified as such in Table 5. Before the proposed repower process begins at the Facility, the Certificate Holder will determine if significant changes to habitat, such as conversion to agricultural use, have occurred in the work area. Additionally, the Certificate Holder will spot-check the areas delineated using aerial imagery, as indicated in Figure 4 and as calculated in Table 5, to ensure accurate designation of habitat category, type, and subtype. The Certificate Holder will submit an updated table and figure to ODOE before repowering activities commence at the Facility.

Table 3. Acreage of the Proposed Work Area by Pre-construction Habitat Category and Type[1]

Classification	Acreage
Access Roads	
3 GL	0.6
3 PC	5.3
3 SS-R	1.4
3 SS-S	3.1
4 GL	0.1
4 PC	3.7
4 RS	0.1
5 PC	3.0
5 PC[2]	1.4
6 DW	55.5
6 DW[2]	2.4
6 RP	0.8
Access Roads Total	*77.3*
Turbine Work Area	
3 PC	3.1
3 SS-R	1.0
3 SS-S	1.9
4 PC	1.0
5 PC	1.0
6 DW	31.4
6 DW[2]	<0.1
6 RP	<0.1
Turbine Work Area Total	*39.4*
Staging Area	
6 DW	1.8

Classification	Acreage
6 DW[2]	3.2
Staging Area Total	*5.1*
Truck Turn-around	
3 PC	0.4
3 SS-R	0.3
3 SS-S	0.1
4 PC	0.3
5 PC	0.1
6 DW	2.1
Truck Turn-around Total	*3.4*
Grand Total	**125.2**

1. Facility access roads are excluded from the work area acreage calculations.
2. Delineated via aerial imagery due to gaps in available habitat data (preconstruction).

Habitat types and subtypes are described in the ASC and in RFA1.

DW = Dryland wheat
GL = Grassland
PC = Previously cultivated
RP = Roads and parking
RS= Rock and sand
SS-B = Shrub-steppe - broom snakeweed steppe
SS-R = Shrub-steppe - rabbitbrush
SS-S = Shrub-steppe - sage steppe

Repower activities in the work area will not result in different habitat types being affected than were affected during initial construction. There are no new areas or resources (e.g., different habitat types) to consider that were not previously evaluated (ODOE 2008, ODOE 2009). The work area required for the repower will be within areas previously disturbed during construction of the Facility, and will disturb these areas to a similar extent as they were temporarily altered for Facility construction. Areas temporarily disturbed by initial construction and subsequent wildfires have been revegetated, and are monitored for success in continuing compliance with Condition 84. No trees greater than 3 feet in height will be removed, in continued compliance with Condition 89. The proposed replacement of turbine elements will not change the overall footprint of the Facility. Permanent and temporary impacts due to the construction of the Facility have been addressed in the Habitat Mitigation Plan. No permanent impacts to habitat will occur during the repower process. No additional temporary disturbance to habitat will occur during the repower process. During the September 17, 2019 consultation, Mr. Cherry (ODFW) indicated that if the repower work areas were limited to previously disturbed areas, no additional mitigation would be recommended for habitat that had already been mitigated for impact. Therefore, no updates to the Habitat Mitigation Plan are necessary. All temporarily disturbed areas will be revegetated according to Condition 77, as is routinely done as part of O&M activities, without need for additional habitat mitigation. Consequently, the proposed amendment requests no changes that

would alter the basis for Council's earlier findings with respect to fish and wildlife habitat, and therefore, Council may find that the amendment request satisfies OAR 345-022-0060 in this regard.

6.8.2 Potential Impacts to State-Sensitive Wildlife Species

The Certificate Holder has conducted biological surveys in the vicinity of the Facility since 2002 (Table 6). Surveys were initially conducted in support of the Shepherds Flat Wind Farm Application for Site Certificate (Caithness Shepherds Flat, LLC 2007). Additional surveys were conducted for the addition of land to the original Site Boundary and subsequent division of the original facility into three facilities: Shepherds Flat North, Central, and South. Following the division, post-construction fatality monitoring (PCFM) and raptor nest surveys have been conducted as shown.

Table 6. Summary of Biological Surveys Conducted within the Facility Vicinity between 2002 and 2017

Years	Surveys	Reference	Extent
2002-2007	Special status wildlife and plant surveys, raptor nest surveys	Caithness Shepherds Flat, LLC 2007	Shepherds Flat Wind Farm as approved, plus varying extents for WAGS, raptor nests, and targeted special status avian surveys (e.g., burrowing owl)
2008-2009	Avian point counts	South Hurlburt Wind, LLC 2009	Previously proposed Saddle Butte Wind Park vicinity
2009	WAGS, black- and white-tailed jackrabbit, burrowing owl surveys	South Hurlburt Wind, LLC 2009	Areas added to Shepherds Flat Central plus 1000-foot buffer
2010-2017	Pre- and post-construction compliance raptor nest surveys	Weisskopf et al. 2014a, 2014b, and 2014c	Pre-construction: Shepherds Flat North, Central, and South plus 0.5-mile buffer around areas of construction disturbance Post-construction: Shepherds Flat North, Central, and South plus 2-mile buffer
2012 -2014	Post-construction fatality monitoring (avian and bat)	Smith et al. 2015a, 2015b, and 2015c	Shepherds Flat North, Central, and South Site Boundary
2017	Post-construction compliance raptor nest survey	Alsup and Smith 2018a, 2018b, and 2018c	Shepherds Flat North, Central, and South, plus 2-mile buffer

The Certificate Holder has reviewed the status of state-sensitive wildlife species observed or with potential to occur within the vicinity of the Facility, including the analysis area (Figure 3) and presents an updated table below (Table 7). This table includes only species with current state-sensitive status in the Columbia Basin Ecoregion with available habitat within the Site Boundary. All species documented during surveys performed during pre-construction, construction, or post-

construction in support of Shepherds Flat North, Central, or South facilities have the potential to occur within the analysis area.

Table 7. State Special-Status Species with the Potential to Occur within the Analysis Area

Common Name	Scientific Name	Federal Status[1]	Status in Columbia Basin - Columbia Plateau Ecoregion[2]	Observed or Expected Occurrence
Mammals				
Hoary bat	*Lasiurus cinereus*	SOC	S	Found during PCFM at all three Facilities (Smith et al. 2015a, 2015b, 2015c).
Pallid bat	*Antrozous pallidus pacificus*	SOC	S	Not documented.
Silver-haired bat	*Lasionycteris noctivagans*	SOC	S	Found during PCFM at all three Facilities (Smith et al. 2015a, 2015b, 2015c).
Spotted bat	*Euderma maculatum*	SOC	S	Not documented.
Townsend's big-eared bat	*Corynorhinus townsendii*	SOC	S	Not documented.
Birds				
Brewer's sparrow	*Spizella breweri*	BCC	S	Found during PCFM at Shepherds Flat North and South (Alsup and Smith 2018a, 2018c).
Burrowing owl (western)	*Athene cunicularia hypugaea*	SOC	SC	Observed and documented nesting during pre-construction surveys only (Caithness Shepherds Flat, LLC 2007).
Common nighthawk	*Chordeiles minor*	none	S	Found during PCFM at the Shepherds Flat Central and North (Smith et al. 2015a, 2015b). Observed during pre-construction surveys (Caithness Shepherds Flat, LLC. 2007).
Ferruginous hawk	*Buteo regalis*	BCC, SOC	SC	Observed and documented nesting during pre-construction surveys (Caithness

Common Name	Scientific Name	Federal Status[1]	Status in Columbia Basin - Columbia Plateau Ecoregion[2]	Observed or Expected Occurrence
				Shepherds Flat, LLC 2007). Observed during RFA 1 surveys for the Shepherds Flat South and Central (South Hurlburt Wind, LLC. 2009, Horseshoe Bend, LLC 2009). Documented nesting during post-construction raptor nest surveys for Shepherds Flat South (Weisskopf et al. 2014c).
Grasshopper sparrow	*Ammodramus savannarum*	none	S	Observed during pre-construction surveys (Caithness Shepherds Flat, LLC 2007).
Lewis's woodpecker	*Melanerpes lewis*	BCC, SOC	SC	Observed during pre-construction surveys (Caithness Shepherds Flat, LLC 2007).
Loggerhead shrike	*Lanius ludovicianus*	BCC	S	Observed during pre-construction surveys (Caithness Shepherds Flat, LLC 2007). Observed during RFA 1 surveys for the Shepherds Flat South and Central (South Hurlburt Wind, LLC 2009, Horseshoe Bend, LLC 2009).
Long-billed curlew	*Numenius americanus*	BCC	SC	Observed during pre-construction surveys (Caithness Shepherds Flat, LLC 2007). Observed during RFA 1 surveys for the Shepherds Flat South and Central

Common Name	Scientific Name	Federal Status[1]	Status in Columbia Basin - Columbia Plateau Ecoregion[2]	Observed or Expected Occurrence
				(South Hurlburt Wind, LLC 2009, Horseshoe Bend, LLC 2009). Found during PCFM at Shepherds Flat North (Smith et al. 2015a).
Sagebrush sparrow	*Artemisiospiza nevadensis*	BCC	SC	Observed during pre-construction surveys (Caithness Shepherds Flat, LLC 2007).
Swainson's hawk	*Buteo swainsoni*	none	S	Found during PCFM at all three Facilities (Smith et al. 2015a, 2015b, 2015c). Observed during pre-construction surveys (Caithness Shepherds Flat, LLC. 2007). Observed during RFA 1 surveys for the Shepherds Flat South and Central (South Hurlburt Wind, LLC. 2009, Horseshoe Bend, LLC. 2009). Documented nesting during raptor nest surveys for all three Facilities (Alsup and Smith 2018a, 2018b, 2018c; Weisskopf et al. 2014a, 2014b, 2014c).
Reptiles / Amphibians				
Northern sagebrush lizard	*Sceloporus graciosus*	SOC	S	Not documented.

Sources: OCS 2016; ODFW 2016; ORBIC 2016; OWE 2019; USFWS 2008, 2019.
1. Federal Status: T = Threatened, SOC = Species of Concern, BCC = Bird of Conservation Concern.
2. Oregon Department of Fish and Wildlife Status: SC = Sensitive-Critical Species, S = Sensitive Species.

Notable is the addition of the hoary bat, Townsend's big-eared bat, and Brewer's sparrow; all three species are now sensitive in the Columbia Basin Ecoregion. The hoary bat roosts in the foliage of trees, generally in late-successional forest habitat (Csuti et al. 2001, OCS 2016). This species is most likely to occur within the Site Boundary as a transient during fall migration. Townsend's big-eared bat roosts in caves, mines, and isolated buildings, and will occasionally roost in trees (Csuti et al. 2001, OCS 2016). This species is also a potential transient.

Brewer's sparrow nests in sagebrush shrubland, generally with a canopy height of more than 5 feet, often associated with big sagebrush, in particular (OCS 2016, Rotenberry et al. 1999). This habitat is limited within the Site Boundary. This migrant species is generally absent from Oregon from October through early March (Sullivan et al. 2009).

The common nighthawk, previously included in the ASC and RFA 1 without a special status designation at the federal or state level, is now sensitive in the Columbia Basin Ecoregion. Also a migrant species, the common nighthawk is generally absent from Oregon from mid-September through mid-May (Sullivan et al. 2009). Table 7 also reflects the updated species name for the sagebrush sparrow, which was listed in RFA 1 as sage sparrow (*Amphispiza belli;* Martin and Carlson 1998).

The primary potential impact to state sensitive species due to the proposed repowering activities at the Facility is direct fatality from collision with or crushing by heavy equipment during the repowering time period. Although northern sagebrush lizard is a terrestrial species, this reptile has not been documented in any surveys conducted at the Facility; therefore, the likelihood of occurrence is low. Additionally, this species is able to move out of the way of equipment; therefore, the risk to crushing this species is extremely low. Crushing or collision is most likely to affect state sensitive ground-nesting grassland bird species such as long-billed curlew, burrowing owl, and grasshopper sparrow, and in particular the common nighthawk, which nests and roosts in open areas including bare ground and gravel. Repowering equipment will generally be moving slowly during blade replacement at each turbine, and while moving between turbines at the Facility. In a given location, the duration of this potential disturbance to potentially roosting common nighthawks will be limited to the extent of an active work area at a given time (Facility access roads and pads around approximately 8-12 turbines, plus any laydown areas), and only for the time period that nighthawks are present. A long-distance migrant, this species is only present in Oregon during its breeding season (June-August; Brigham et al. 2011, Sullivan et al. 2009). Equipment will only operate on Facility access roads, turbine pads, and other developed areas where Facility operations regularly occur, and in limited areas of vegetation previously disturbed during construction. The activities described in this RFA do not present an increase in direct fatality risk to most nesting grassland species; however, there may be an elevated potential for collision with nighthawks in active work areas from June-August. This potential to crush or collide with state-sensitive species during the turbine repowers proposed in this RFA are avoided and minimized by existing Site Certificate measures, as specified in Condition 92 (a 20-mile per hour speed limit is observed on Facility access roads).

An additional potential impact to state-sensitive species is disturbance associated with increased human activity to raptor species during nesting season, including ferruginous hawk and Swainson's hawk. Turbine upgrades are scheduled to overlap with the nesting season for raptors (February 1 – August 31). Repowering activities as described in Section 3.0 will vary over the course of the Facility-wide repower process. For instance, at a single turbine, vehicle and crane activity will occur over the course of two weeks or less. The nature, duration, and extent of these activities are the same as what is necessary to carry out existing and already scheduled maintenance at Facility turbines as permitted. Raptor nest avoidance is not required under the site certificate for maintenance activities; however, activities in areas such as staging areas may be more frequent than those at individual turbines and may occur over a longer time period, potentially posing elevated disturbance levels to nesting raptors. The ODFW-recommended nest avoidance buffer distances for ferruginous hawk and Swainson's hawk is 0.25 miles. The likelihood of a state-sensitive species raptor nest to occur within an 0.25-mile buffer of a laydown area is extremely low. As noted in the WMMP and as shown in raptor nest surveys, nesting density in the area is low, and is even lower within the Site Boundary; therefore, the potential for repower activities to disturb nesting raptors is low (Weisskopf et al. 2014a, 2014b, 2014c; Alsup and Smith 2018a, 2018b, 2018c). As requested by ODFW (pers. comm. Steve Cherry, 9/17/2019), the Certificate Holder will perform raptor nest surveys to locate active nests that may be disturbed by repower activities at the Facility. The Certificate Holder will coordinate with ODFW to identify the appropriate timing, extent, and methods for these surveys, and to ensure that measures are implemented to avoid and minimize disturbance to nesting raptors during the proposed blade replacement process.

The replacement of the current 100-meter rotor diameter blades with larger 127-meter rotor diameter blades will not change the peak generating capacity (318 MW), the number of turbines (106), or the hub height of turbines at the Facility. The effect of turbine size on bird and bat collision rates remains unclear (AWWI 2017), particularly with respect to blade length (e.g., blade-only replacements without corresponding changes to hub height). A summary of findings from the most relevant studies are provided in Table 8. These studies reveal that numerous factors can influence avian and bat fatality rates at a given wind project, and indicate that data gaps exist for isolating the effect a single variable, such as blade length, has on fatality rates.

Table 8. Summary of Studies Investigating the Effects of Turbine Size on Bird and Bat Mortality

Reference	Turbine Size Variables Investigated	Range of Variables Investigated	Findings
Barclay et al. 2007	Hub height	24-94 meters	Bat mortality increased with hub height; No effect on bird mortality
	Rotor swept area	167-5027 meters^2	No effect on bird or bat mortality
	Rotor diameter	15-80 meters	No effect on bird or bat mortality

Reference	Turbine Size Variables Investigated	Range of Variables Investigated	Findings
de Lucas et al. 2008	Hub height	18-36 meters	Bird mortality increased with hub height
Everaert 2014	Rotor swept area (meters^2)	398-5281 meters^2	No effect on bird mortality
Loss et al. 2013	Hub height	36-80 meters	Bird mortality increased with hub height
Zimmerling and Francis 2016	Total turbine height	117-136 meters	No effect on bat mortality

Based on existing studies, the effect on collision risk based on specific turbine size variables is equivocal. Therefore, any differences in avian and bat impacts as a result of the turbine modifications may be undetectable. In the Draft Proposed Order for the neighboring Shepherds Flat Central Facility's RFA 2, ODFW concurred with the Certificate Holder following a review of these studies that a change in minimum aboveground blade tip clearance and rotor diameter does not represent a direct correlation in bird and bat fatality risk (ODOE 2019). Nonetheless, per the request of ODFW (pers. comm. Steve Cherry, 9/17/2019), to improve scientific understanding of larger turbine components on birds and bats, the Certificate Holder proposes to conduct one year of post-repowering fatality monitoring at the Facility. The protocol will follow current best available science, and will allow the applicant to estimate with statistical confidence the total number of bird and bat fatalities that are occurring at the Facility following repowering. The study protocol will be submitted to ODFW for approval in a revised WMMP prior to the commencement of the repowering activities proposed in this amendment.

The proposed Facility modifications do not present impacts that would alter the basis for Council's earlier findings with respect to state-sensitive wildlife species. Potential disturbances related to the operations and maintenance activities described in this request are avoided and minimized by existing Site Certificate measures, primarily as specified in Condition 92 (a 20 mile per hour speed limit is observed on Facility access roads). Potential disturbance to nesting state-sensitive raptor species, while unlikely and limited to areas where activities may be more frequent and may occur over a longer time period, will be avoided and minimized in consultation with ODFW as described above. Additionally, while the Certificate Holder and ODFW concur that a change in minimum aboveground blade tip clearance and rotor diameter does not represent a direct correlation in bird and bat fatality risk, the WMMP will be amended in consultation with ODFW, as permitted by existing Condition 83. Consequently, the proposed amendment requests no changes that would

alter the basis for Council's earlier findings with respect to state-sensitive species, and therefore, Council may find that the amendment request satisfies OAR 345-022-0060 in this regard.

6.9 Threatened and Endangered Species – OAR 345-022-0070

To issue a site certificate, the Council, after consultation with appropriate state agencies, must find that:

(1) For plant species that the Oregon Department of Agriculture has listed as threatened or endangered under ORS 564.105(2), the design, construction and operation of the proposed facility, taking into account mitigation:

(a) Are consistent with the protection and conservation program, if any, that the Oregon Department of Agriculture has adopted under ORS 564.105(3); or

(b) If the Oregon Department of Agriculture has not adopted a protection and conservation program, are not likely to cause a significant reduction in the likelihood of survival or recovery of the species; and

(2) For wildlife species that the Oregon Fish and Wildlife Commission has listed as threatened or endangered under ORS 496.172(2), the design, construction and operation of the proposed facility, taking into account mitigation, are not likely to cause a significant reduction in the likelihood of survival or recovery of the species.

The Council previously found that the design, construction, operation and retirement of the initially proposed Facility (ODOE 2008), as well as each of the Shepherds Flat North, Shepherds Flat Central, and Shepherds Flat South facilities as described in RFA 1 (ODOE 2009), did not have the potential to significantly reduce the likelihood of the survival or recovery of any Threatened or Endangered plant or wildlife species listed under Oregon law. Based on these findings and subject to the site certificate conditions described in the ASC and RFA 1, the Council concludes that the proposed facility complies with the Threatened and Endangered Species Standard.

The Certificate Holder has reviewed the status of state-endangered, threatened, and candidate species with the potential to occur within the Site Boundary, and presents an updated table (Table 9).

Table 9. State-Listed Species with the Potential to Occur within the Site Boundary

Common Name	Scientific Name	Federal Status[1]	State Status[2, 3]
Mammals			
Washington ground squirrel	*Uroticellus washingtoni*	SOC	E
Plants			
Disappearing monkeyflower	*Mimulus evanescens*	none	C
Dwarf evening primrose	*Camissonia pygmaea*	SOC	C
Hepatic monkeyflower	*Mimulus jungermannoides*	SOC	C

Common Name	Scientific Name	Federal Status[1]	State Status[2, 3]
Laurence's milk-vetch	*Astragalus collinus var. laurentii*	SOC	T
Sessile mousetail	*Myosurus sessilis*	SOC	C

Sources: ODA 2018, ODFW 2018, USFWS 2019.

1. USFWS Federally Listed Species: SOC = Species of Concern.

2. ODFW State Listed and Sensitive Species: E = Endangered, T = Threatened, S=Sensitive, SC = Sensitive Critical.

3. ODA State Listed Plant Species: T=Threatened, E=Endangered, C=Candidate.

ODFW lists 30 fish and wildlife species as threatened and endangered under ORS 496.172(2) (ODFW 2018). This includes 26 species associated with aquatic and marine environments that are absent from the Site Boundary. Of the remaining species, only the Washington ground squirrel (WAGS) is listed by the ORBIC (2016) as occurring in the Columbia Plateau Ecoregion (Table 9).

No state-threatened, endangered, or candidate plant species have been found to occur at the Facility (Table 9). The Council previously found that the design, construction, and operation of the Facility are not likely to cause a significant reduction in the likelihood of survival or recovery of Laurence's milk-vetch (*Astragalus collinus var. laurentii*), which has the potential to occur within limited habitats within the Site Boundary (ODOE 2008, ODOE 2009). Revegetated areas that will be disturbed by repower activities do not contain any Laurence's milk-vetch suitable habitat. No suitable habitats for the other state-threatened, endangered or candidate plant species that have the potential to occur (based on range) have been identified within the Site Boundary. Revegetated areas of potential disturbance are not suitable habitat for any state-threatened, endangered, or candidate plant species; therefore, no adverse effect to threatened, endangered, or candidate plant species is expected as a result of RFA 2.

No state-endangered, threatened, or candidate wildlife species have been recorded within the Site Boundary (ODOE 2008, ODOE 2009). A single WAGS burrow was located within the Site Boundary for the neighboring Shepherds Flat Central, as described in the ASC and RFA 1 (ODOE 2008, ODOE 2009). No Washington ground squirrels or active burrows were located within the current Site Boundary at Shepherds Flat South. Revegetated areas of potential disturbance are not suitable habitat for the species listed in Table 9. The proposed decrease in aboveground blade tip clearance at repowered turbines presents no additional risk to any of these species. The proposed amendment requests no changes that would alter the basis for the Council's earlier findings, and therefore, the Council may find that the amendment request satisfies OAR 345-022-0070.

6.10 Scenic Resources – OAR 345-022-0080

(1) Except for facilities described in section (2), to issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impact to scenic 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.

(2) The Council may issue a site certificate for a special criteria facility under OAR 345-015-0310 without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

The Council previously found that the design, construction, and operation of the Facility, as amended, was not likely to result in significant adverse impact to scenic resources (ODOE 2008, ODOE 2009, ODOE 2010). The change proposed in RFA 2 does not alter the basis of this finding.

As noted in the Final Order on the ASC, the Certificate Holder completed a Zone of Visual Influence (ZVI) analysis (for turbines up to 492 feet or 150 meters tall) within a 30-mile analysis area to evaluate potential visual impacts related to the change in existing visual character that would result from operation of the Facility. The 30-mile analysis area was specified by the Project Order, issued October 16, 2006, based on Council rules in effect at that time. The Council amended OAR 345-001-0010(57) in May 2007, reducing the "study area" for scenic resources to the area within the Site Boundary and the area within 10 miles from the Site Boundary. The Study Area for RFA 2 is shown on Figure 3. Morrow and Gilliam counties are the only counties within the 10-mile analysis area. The only land use or management plans that have been updated since the last amendment for the Facility within the analysis area is Gilliam County Comprehensive Plan (updated in 2017). The update did not identify additional scenic resources or include provisions that would warrant changes to the previous analyses of scenic resources in Gilliam County.

The changes proposed in RFA 2 will not change the basis for the Council's previous findings regarding potential visual impacts to identified scenic resources. Upgrading the turbines will increase the blade length and the overall turbine height (proposed height change from 135 to 150 meters or 492 feet) relative to the dimensions of the existing turbines installed at the Facility. However, the new height will remain at the maximum turbine height originally analyzed and approved by the Council. The ZVI analysis reported in the Final Order on the ASC was for turbines up to 150 meters or 492 feet in height (ODOE 2008).

This request does not seek to enlarge the existing Site Boundary of the Facility. The footprint required for the upgrading will be within the previously disturbed areas from construction of the Facility. There is no change to the previously approved maximum number of turbines, maximum turbine height, maximum generating capacity, or infrastructure locations of the Facility. Consequently, the proposed amendment requests no changes that would alter the basis for Council's earlier findings, and therefore, Council may find that the amendment request satisfies OAR 345-022-0080.

6.11 Historical, Cultural and Archaeological Resources – OAR 345-022-0090

(1) Except for facilities described in sections (2) and (3), to issue a site certificate, the Council must find that the construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impacts to:

(a) Historic, cultural or archaeological resources that have been listed on, or would likely be listed on the National Register of Historic Places;

(b) For a facility on private land, archaeological objects, as defined in ORS 358.905(1)(a), or archaeological sites, as defined in 358.905(1)(c); and

(c) For a facility on public land, archaeological sites, as defined in ORS 358.905(1)(c).

(2) The Council may issue a site certificate for a facility that would produce power from wind, solar or geothermal energy without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

(3) The Council may issue a site certificate for a special criteria facility under OAR 345-015-0310 without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

The analysis area for Exhibit S of RFA 2 is limited to the micrositing corridors of the proposed Facility modifications. This area is within the Shepherds Flat Site Boundary that defined the analysis area examined in Exhibit S of the ASC and Final Order on the ASC (Caithness Shepherds Flat, LLC 2007, ODOE 2008).

The Certificate Holder provided information regarding historic, cultural, and archaeological resources for the analysis area in Exhibit S of the ASC and the Final Order on the ASC, in which the Council reviewed cultural resource surveys conducted within the Shepherds Flat Site Boundary (Caithness Shepherds Flat, LLC 2007, ODOE 2008). Cultural resource studies were conducted in support of the ASC and in consultation with the State Historic Preservation Office (SHPO), the Confederated Tribes of Warm Springs, and the Confederated Tribes of the Umatilla Indian Reservation (Ellis et al. 2006, Adams et al. 2008).

The Certificate Holder contracted with Archaeological Investigations Northwest, Inc. (AINW) to conduct a comprehensive review of archaeological records maintained by the Oregon SHPO (Ellis et al. 2006). AINW found that there had been only three previous archaeological or cultural resource surveys conducted within the Shepherds Flat Site Boundary or its immediate vicinity and that there had been no previous surveys within the southern area of the Shepherds Flat Site Boundary. AINW's records search showed there were no resources within the Shepherds Flat Site Boundary that were listed on the National Register of Historic Places (NRHP). AINW also conducted an archaeological sensitivity analysis of the Site Boundary for use in Project design.

In 2007, 2010, and 2011, AINW (Ellis et al. 2006 and Adams et al. 2008) and Bionomics Environmental, Inc. (DePasqual and Nickoloff 2012), surveyed the entire Shepherds Flat Site Boundary in accordance with SHPO's *Guidelines for Conducting Field Archaeology in Oregon*. Of the resources identified within the larger Shepherds Flat Site Boundary, three historic isolates and one historic archeological site are within the analysis area of this RFA (Table 10). Two of the isolates are not eligible for listing on the NRHP. The remaining third isolate is possibly eligible for listing on the NRHP. The archaeological site, 35GM00290, is a refuse scatter immediately adjacent to the analysis area and is unevaluated for listing on the NRHP.

Table 10. Cultural Resources within the RFA Analysis Area

Identification Number	Time Period	Site Type	NRHP Status[1]
07/1539-89	Historic	Isolate, 1 SCA fragment	Not Eligible
07/1539-99	Historic	Isolate, Scatter of Farm Equipment	Possibly Eligible
07/1539-100	Historic	Isolate, Whiteware sherds	Not Eligible
35GM00290*	Historic	Refuse Scatter	Unevaluated
Tiqaxtiqax	TCP	TCP	Eligible

1. Ellis et al.2006, Adams et al. 2008.

* 35GM00290 is immediately adjacent to the analysis area.

An updated records search in SHPO's Oregon Archaeological Resources Remote Access and Historic Sites databases was conducted on September 3, 2019. In addition to the above resources identified by surveys for the ASC, one Traditional Cultural Property (TCP), Tiqaxtiqax, was identified as part of the updated records search. The TCP appears to have been identified around 2015, after completion of the ASC and certification of the Shepherds Flat project. It covers much of the analysis area (Table 10) and is NRHP-eligible. Consultations with the Confederated Tribes of Warm Springs, Confederated Tribes of the Umatilla Indian Reservation, and SHPO were conducted as part of the ASC. Those consultations did not identify any significant impacts to resources of tribal significance. Effects of the actions proposed in this RFA are not anticipated to have significant effects on the TCP Tiqaxtiqax. The Facility is built and the RFA does not proposed any new construction, only larger blades. The primary impact would be visual; however, the visual impact of the longer blades is considered minimal (see Section 6.10 and below)

All of the archaeological resources in the analysis area were previously evaluated in Exhibit S of the ASC and Final Order on the ASC and mitigation measures were implemented to prevent impacts (Caithness Shepherds Flat, LLC 2007, ODOE 2008). Although the TCP was not identified in the ASC, previous SHPO and tribe consultations were conducted as part of the ASC and no TCPs were found. The change proposed in RFA 2 is not likely to result in significant adverse impacts to these cultural resources for the reasons stated below.

The Council adopted Site Certificate conditions, including mitigation and inadvertent discovery measures (Conditions 43, 45, and 46 applicable to upgrading and operations) to address the Historic, Cultural and Archaeological Resources Standard; thus, the Facility satisfied the Historic, Cultural and Archaeological Resources Standard (ODOE 2008, ODOE 2009, ODOE 2010). The Facility is already constructed such that the Certificate Holder met all pre-construction and construction conditions, and will continue to meet construction measures, as they apply to repowering, and operation conditions as documented through annual reporting.

The upgrading of the turbines will not require ground disturbance beyond what was previously surveyed or disturbed, or otherwise alter the Council's previous findings regarding the Historic, Cultural and Archaeological Resources Standard. Ground disturbance during upgrading will be

limited to the surface area and depths that were previously disturbed during construction of the Facility. The Certificate Holder will continue to adhere to the Site Certificate conditions, specifically those regarding inadvertent discoveries and avoidance of known archaeological resources.

The proposed Facility modifications will not affect cultural resources. Upgrading will increase the blade length and the overall turbine height (proposed maximum height change from 135 to 150 meters) relative to the dimensions of the existing turbines installed at the Facility. The difference in height for the turbines will be minor, however, and will not likely be noticeable to observers in the vicinity of any nearby cultural resources, including within the TCP Tiqaxtiqax. In addition, the new height will remain lower than the maximum turbine height approved under the Final Order on the ASC, which provided the basis for the original impact analysis (ODOE 2008). This request does not seek to enlarge the existing Site Boundary or to change the previously approved maximum number of turbines, maximum turbine height, maximum generating capacity, or infrastructure locations of the Facility. Impacts to any unidentified cultural resources protected by the Council siting standards will continue to be avoided through implementation of the inadvertent discovery condition of the Site Certificate (Condition 45). Thus, the proposed amendment makes no changes that would alter the basis for Council's earlier findings. No changes to the Site Certificate conditions related to the Historic, Cultural and Archaeological Resources Standard are required and OAR 345-022-0090 is met.

6.12 Recreation – OAR 345-022-0100

(1) Except for facilities described in section (2), to issue a site certificate, the Council must find that the design, construction and operation of a facility, taking into account mitigation, are not likely to result in a significant adverse impact to important recreational opportunities in the analysis area as described in the project order. The Council shall consider the following factors in judging the importance of a recreational opportunity:

(a) Any special designation or management of the location;

(b) The degree of demand;

(c) Outstanding or unusual qualities;

(d) Availability or rareness;

(e) Irreplaceability or irretrievability of the opportunity.

(2) The Council may issue a site certificate for a special criteria facility under OAR 345-015-0310 without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

The Recreation Standard requires the Council to find that the design, construction, and operation of a facility will not likely result in significant, adverse impacts to important recreational opportunities. Therefore, the Council's Recreation Standard applies to only those recreation areas that the Council deems important. The Council previously found that the design, construction, and operation of the Facility, as amended, were not likely to result in significant adverse or direct

impact to important recreational opportunities in the analysis area (ODOE 2008, ODOE 2009, ODOE 2010). The Council did not impose any conditions related to this standard. The Council did not identify any recreational opportunities within the 5-mile analysis area as important according to the factors listed in the Recreation Standard. Therefore, the Council previously found that the Facility would have no direct effect on any important recreational opportunities in the analysis area. The change proposed in RFA 2 does not alter the basis of this finding.

Within the 5-mile analysis area (Figure 3), there are no one new recreational opportunities. Previously identified recreational opportunities within the analysis area include the Earl Snell Memorial Park, Alkali Park, the Port of Arlington, China Creek Golf Course, Columbia River RV and Mobile Home Park, and the Willow Creek Wildlife Area. All sites were deemed not important recreational opportunities by the Council (ODOE 2008) according to the factors listed in the Recreation Standard. This request does not seek to enlarge the existing Site Boundary, and there is no change to the previously approved maximum number of turbines, maximum generating capacity, maximum allowed turbine height or infrastructure locations of the Facility. The proposed amendment makes no changes that would alter the basis for the Council's earlier findings, or its conclusion that the Facility would not likely result in a significant adverse impact to any important recreational opportunities in the analysis area, and therefore the amendment request meets the requirement of OAR 345-022-0100.

6.13 Public Services – OAR 345-022-0110

(1) Except for facilities described in sections (2) and (3), to issue a site certificate, the Council must find that the construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impact to the ability of public and private providers within the analysis area described in the project order to provide: sewers and sewage treatment, water, storm water drainage, solid waste management, housing, traffic safety, police and fire protection, health care and schools.

(2) The Council may issue a site certificate for a facility that would produce power from wind, solar or geothermal energy without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

(3) The Council may issue a site certificate for a special criteria facility under OAR 345-015-0310 without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

The Council relied on information provided in the ASC and in subsequent amendment requests to conclude that the Public Services Standard was met for the existing Facility (Caithness Shepherds Flat, LLC 2007, ODOE 2008, ODOE 2009, ODOE 2010). The Council adopted Site Certificate conditions to address the Public Services Standard. The Facility is already constructed such that the Certificate Holder met all pre-construction and construction conditions, and will continue to meet construction measures, as they apply to upgrading (see Table 2), and operation conditions as

documented through annual reporting. The upgrading and operation of the turbines does not affect the Certificate Holder's ability to comply with the Site Certificate conditions as written.

It is assumed that the upgrade will have a duration of 7 months and will require an estimated maximum of 60 workers on-site at one time. The Certificate Holder conservatively assumes that 30 percent of workers are local, with the remainder of workers representing non-local workers; however, the Certificate Holder intends to hire and train local workers to the greatest degree possible.

While the repowered turbines are entirely within Gilliam and Morrow counties, the analysis area includes portions of Sherman County and incorporated communities in Oregon within a 20-mile radius of the upgraded turbines. Incorporated communities within the 20-mile analysis area are: Arlington, Ione, Lexington, and Boardman. The 2010 population for all of these communities was 4,373 (U.S. Census Bureau 2010). Since then, all of the communities except Boardman have lost population, and the total population of the same communities estimated for 2017 is 4,311 (U.S. Census Bureau 2017), a decrease of approximately 1 percent. The largest community in the analysis area is Boardman, with a 2017 population of approximately 3,310. In 2017, an estimated 6,571 housing units were present in Morrow, Gilliam, and Sherman counties, an increase of approximately 1 percent over 2010 levels. Housing vacancy rates in the analysis area average approximately 19 percent for these counties, slightly higher than the 17.5 percent rate described in 2010 (U.S. Census Bureau 2010, U.S. Census Bureau 2017). Therefore, there would be no significant adverse impact to housing.

The proposed upgrades to the turbines will not affect any aspect of the analysis conducted to support issuance of the Site Certificate with regards to public services. The Facility is already constructed and is operational. The upgrade work for the Facility will be short-term and temporary and the influx of workers necessary for the proposed RFA 2 Facility modifications will be less than what was previously approved by the Council. No operations staff changes are expected following the installation of the upgraded turbines, and therefore no new, permanent residents would require housing, schools, or other services. Therefore, the ability of communities to provide housing, police and fire protection, health care and school is not likely to be significantly impacted.

The findings in the Final Order on the ASC and subsequent amendments were based in part on the public service providers' representations of their ability to provide their respective services. In August 2019, each of the public service providers listed in the Final Order on the ASC was contacted and confirmation was received that the Gilliam County Sheriff Department, Morrow County Sheriff Department, City of Arlington, North Gilliam County Rural Fire Protection District, and the Ione Rural Fire Protection District will continue to be able to provide the services listed to serve the facility (see Attachment 5). The Certificate Holder will minimize road and transportation impacts (Condition 66) and coordinate with the local jurisdiction regarding road impacts including post-repower repair, as needed (Condition 67).

Water during construction will likely continue to be provided by the City of Arlington (see Section 6.19). During operation, water will continue to be provided by an on-site well, and sanitary water will be disposed of at on-site septic systems. No stormwater drainage services will be required. The

proposed RFA 2 Facility modifications will generate solid waste including non-hazardous packaging associated with equipment, removed wind turbine blades, and erosion control materials (i.e. straw bales and silt fencing) which will be removed and recycled or taken to landfill in compliance with federal, state and local regulations (see Section 6.14). Upgrading the Facility will not increase the amount of solid waste generated by the Facility during operation. Currently, turbine blades and other materials used for Facility maintenance are taken to the Columbia Ridge Landfill. The Columbia Ridge Landfill has adequate capacity to accommodate construction-related debris and is not expected to reach its full capacity for more than 100 years (see Attachment 5).

RFA 2 makes no changes to the Facility configuration, and there are no other circumstances that would alter the basis for the Council's earlier determination. The Certificate Holder will comply with site certificate conditions applicable to the upgrading (see Table 2) which include fire prevention and response training (Condition 52), fire safety plans (Condition 55), following manufacturer installation guidelines (Condition 59) and safety monitoring program (Condition 62). Accordingly, the Council may find that the proposed amendment meets OAR 345-022-0110 and no changes to the Site Certificate conditions related to the Public Services Standard are required.

6.14 Waste Minimization – OAR 345-022-0120

(1) Except for facilities described in sections (2) and (3), to issue a site certificate, the Council must find that, to the extent reasonably practicable:

(a) The applicant's solid waste and wastewater plans are likely to minimize generation of solid waste and wastewater in the construction and operation of the facility, and when solid waste or wastewater is generated, to result in recycling and reuse of such wastes;

(b) The applicant's plans to manage the accumulation, storage, disposal and transportation of waste generated by the construction and operation of the facility are likely to result in minimal adverse impact on surrounding and adjacent areas.

(2) The Council may issue a site certificate for a facility that would produce power from wind, solar or geothermal energy without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

(3) The Council may issue a site certificate for a special criteria facility under OAR 345-015-0310 without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility.

The Council previously found that the accumulation, storage, disposal, and transportation of waste generated by construction and operation of the Facility are not likely to have an adverse impact on surrounding and adjacent areas (ODOE 2008) and that the Facility complies with the Waste Minimization standard. The Facility is already constructed such that the Certificate Holder met all pre-construction and construction conditions, and will continue to meet construction measures, as they apply to upgrading, and operation conditions as documented through annual reporting. Site

Certificate conditions to address the Waste Minimization Standard directly applicable to upgrading the turbines includes Conditions 50, 51, 100, 101, and 102 (see also Table 2).

Non-hazardous, inert wastes types generating during upgrading would include packaging associated with equipment, removed wind turbine blades, and erosion control materials (i.e. straw bales and silt fencing). Most solid waste will be removed from the site and reused, recycled, or disposed of at an appropriate facility and in compliance with U.S. Environmental Protection Agency standards and the Morrow County Solid Waste Management Ordinance (Chapters 3-7). Metal components will be transported to a smelter to be melted down, and fiberglass components will be cut to standard truck-load size on site (with dust control) and transported to a certified fiberglass landfill. Any batteries, oils, light bulbs, or e-waste will be put in appropriate waste disposal bins provided by U.S. Ecology and transported to GE Renewables' approved recycling and disposal facilities. Solid waste from operations of the upgraded the turbines will not exceed the existing amount of solid waste generated from the Facility. Water used during upgrading would not be discharged to wetlands, lakes, rivers, or streams. Upgrade employees will adhere to both construction and operation waste management plans as applicable.

RFA 2 will not impact the Facility's ability to comply with existing Site Certificate conditions for waste management, and is not anticipated to increase the amount of solid waste and wastewater generated by the Facility during operations. This request does not seek to enlarge the existing Site Boundary, and the upgrading activities will be short-term and temporary. There is no change to the previously approved maximum number of turbines, maximum generating capacity, or infrastructure locations from what was originally authorized. Therefore, Council may rely on its prior analysis to conclude that OAR 345-022-0120 is met and no changes to the Site Certificate conditions related to the Waste Minimization Standard are required.

6.15 Public Health and Safety Standards for Wind Energy Facilities – OAR 345-024-0010

To issue a site certificate for a proposed wind energy facility, the Council must find that the applicant:

(1) Can design, construct and operate the facility to exclude members of the public from close proximity to the turbine blades and electrical equipment.

(2) Can design, construct and operate the facility to preclude structural failure of the tower or blades that could endanger the public safety and to have adequate safety devices and testing procedures designed to warn of impending failure and to minimize the consequences of such failure.

The Council previously found that the Facility complies with the Public Health and Safety Standards for wind energy facilities (ODOE 2008, ODOE 2009, ODOE 2010). This finding was based on the conclusion that the Certificate Holder could design, construct, and operate the Facility to preclude structural failure of the tower or blades that could endanger public safety, to have adequate safety devices and testing procedures designed to warn of impending failure, and to minimize the

consequences of such failure. RFA 2 would not modify the Facility's ability to comply with the Public Health and Safety Standard for wind facilities.

The proposed changes are on existing turbines in rural eastern Oregon, located entirely on private property that restricts public access to turbine and other Facility component locations in compliance with Site Certificate Conditions 61 and 64. The Facility is already constructed such that the Certificate Holder met all pre-construction, construction, and operation conditions, and will continue to meet construction measures as they apply to RFA 2. The Facility currently excludes members of the public from close proximity to the turbine blades and electrical equipment through a combination meeting all turbine setbacks, the Facility's location on private land, and the limited population base in the vicinity. The turbines will be operated in the same manner after upgrades are complete. The turbine modifications will be designed with several levels of built-in safety systems and comply with the codes set forth by the Occupational Safety and Health Administration and American National Standards Institute.

In accordance with Site Certificate Condition 62, an operational safety-monitoring program continues to be implemented to monitor and repair turbines and turbine components as necessary to protect public safety. In accordance with Site Certificate Condition 59, the Certificate Holder continues to follow the manufacturers' handling instructions and procedures for new turbine components needed for upgrading. Per Site Certificate Condition 71, if any accidents or mechanical failures occur, they will be reported to ODOE and Gilliam and Morrow counties. Additionally, no changes to the transmission lines are proposed, but the lines will continue to be monitored and maintained per Site Certificate Condition 81 to protect the public from exposure to electromagnetic fields.

The fire risks for the Facility as proposed are similar to the risks previously considered by the Council. Site Certificate conditions addressing fire protection and response include Site Certificate Conditions 53, 54, 55, 56, 58, and 60. The changes requested by RFA 2 would not result in new fire risks that would be different from the types of risk already considered by the Council; therefore, no new fire protection conditions are necessary.

Determinations of No Hazard to Air Navigation have been received for all previously constructed turbines at the Facility. Because the upgrading of the turbines will alter the existing turbine height, the Certificate Holder will be required to submit the Notice of Alteration to the Federal Aviation Administration (FAA), per Site Certificate Condition 57. As done previously, the results of this notice will be provided to the Oregon Department of Agriculture and the Boardman Military Operating Area, which lies east of the Facility.

Upgrading will increase the blade length and the overall turbine height on all existing turbines relative to the dimensions of the existing turbines at the Facility. These turbine dimensions have been approved for several facilities under Council jurisdiction. This request does not seek to enlarge the existing Site Boundary, and there is no change to the previously approved maximum number of turbines, maximum generating capacity, or infrastructure locations from what was originally authorized. The proposed amendment makes no changes that would alter the basis for the Council's earlier findings, nor change the Certificate Holder's ability to comply with the intent of

any requirements and conditions issued by the Council regarding public health and safety. Therefore, the Council may find that OAR 345-024-0010 is satisfied.

6.16 Siting Standards for Wind Energy Facilities – OAR 345-024-0015

To issue a site certificate for a proposed wind energy facility, the Council must find that the applicant can design and construct the facility to reduce cumulative adverse environmental effects in the vicinity by practicable measures including, but not limited to, the following:

(1) Using existing roads to provide access to the facility site, or if new roads are needed, minimizing the amount of land used for new roads and locating them to reduce adverse environmental impacts.

(2) Using underground transmission lines and combining transmission routes.

(3) Connecting the facility to existing substations, or if new substations are needed, minimizing the number of new substations.

(4) Designing the facility to reduce the risk of injury to raptors or other vulnerable wildlife in areas near turbines or electrical equipment.

(5) Designing the components of the facility to minimize adverse visual features.

(6) Using the minimum lighting necessary for safety and security purposes and using techniques to prevent casting glare from the site, except as otherwise required by the Federal Aviation Administration or the Oregon Department of Aviation.

The Council previously found that the Certificate Holder could design and construct the Facility to reduce visual impacts, to restrict public access, and to reduce cumulative adverse environmental impacts in the vicinity of the Facility to the extent practicable in accordance with the requirements of OAR 345-024-0015 (ODOE 2008, ODOE 2009, ODOE 2010). Specifically, in approving the ASC, the Council considered and made findings regarding cumulative impacts of the Facility related to 1) roads, 2) transmission lines and substations, 3) wildlife protection, 4) visual features, and 5) lighting. The Council adopted Site Certificate conditions to address the Siting Standard: Site Certificate Conditions 58, 86, 93, and 95 are directly applicable to the proposed upgrade. The Facility is already constructed such that the Certificate Holder met all pre-construction and construction conditions, and will continue to meet construction measures, as they apply to upgrading, and operation conditions as documented through annual reporting.

The Facility is operational, with existing access roads that would be used for this RFA to perform the upgrade. There would be no changes to the existing substation or transmission line. Upgrading the turbines will increase the blade length and the overall turbine height compared to the dimensions of the existing turbines at the Facility; however, the new height will remain lower than the previously approved maximum turbine height on which the original visual analysis was based. Site Certificate Condition 93 has and will continue to be implemented to minimize visual impacts through the prohibition of advertising material at the Facility and maintenance of onsite signage.

There would be no changes to lighting as part of RFA 2 other than those that may be required by FAA although changes are not anticipated.

This request does not seek to enlarge the existing Site Boundary, rather the upgrade will occur at existing turbines within the existing Site Boundary. The footprint required for the upgrades will be within the previously disturbed areas from initial construction of the Facility. Proposed changes will not significantly affect wetlands or other waters of the state because construction related to RFA 2 will avoid impacts to wetlands and waters. There is no change to the previously approved maximum number of turbines, maximum generating capacity, or infrastructure locations from what was originally authorized. The proposed amendment makes no changes that would alter the basis for the Council's earlier findings, and therefore, the proposed amendment request satisfies OAR 345-024-0015.

6.17 Noise Control Regulations – OAR 340-035-0035

The Certificate Holder addressed compliance with the Oregon Department of Environmental Quality (ODEQ) noise regulations in Exhibit X of the ASC. The requirements of OAR 340-035-0035(1)(b)(B)(iii) apply to noise levels generated by a "wind energy facility." Therefore, the Project is reviewed under OAR 340-035-0035(1)(b)(B)(iii). Under the regulation, the noise generated by a new wind energy facility located on a previously unused site must comply with two tests: the "ambient noise degradation test" and the "maximum allowable noise test"; however, if a wind energy facility is planned on a previously used site, then it must just demonstrate compliance with the "maximum allowable noise test". Since the Facility is operational, it will be constructed on a previously used site. According to ODOE's findings for the Stateline Wind Project, "…the Council assumes that because the facility is currently in operation and has been in operation for more than 10 years, the site, could be characterized as previously used – and the standards that apply to a previously used site could be use."

OAR 340-035-0035(5)(g) specifically exempts noise caused by construction activities. As reviewed by the Council in the ASC, construction of the Project would produce localized, short-duration noise levels similar to those produced by any large construction project with heavy construction equipment. To reduce noise impacts at nearby noise sensitive receptors (NSRs), the Council prescribed Site Certificate Condition #96 to confine the noisiest operation of heavy construction equipment to daylight hours, require contractors to install and maintain exhaust mufflers on all combustion engine-powered equipment, and establish a complaint response system at the construction manager's office to address noise complaints.

The Council previously imposed Site Certificate Condition #97, which requires that the final design locations, sound power levels, noise analysis, and noise easements be provided to ODOE to demonstrate that the Facility complies with ODEQ's noise control standards in OAR 340-035-0035. As originally proposed and amended (RFA 1), the Council concluded that the Facility, subject to site certificate conditions, would comply with the applicable State noise regulations. In support of RFA 1, a noise study had been conducted based on a layout of 116 GE 2.5 MW wind turbines, representing the final facility design layout. The noise study results indicated compliance with the

ODEQ 50 A-weighted decibels (dBA) L_{50} limit at all 29 NSRs. However, the results of the modeling analysis also indicated that all 20 of the 29 NSRs (R-1, R-16, R-17, R-18, R-19, R-20, R-21, R-22, R-23, R-24, R-25, R-26, R-27, R-28, R-29, R-30, R-33, R-34, R-35 and R-26) would exceed the ambient hourly L_{50} ambient degradation limit of 36 dBA. Therefore, it was required that either the facility design layout be modified to reduce sound levels at NSRs below the 36 dBA limit or that noise waivers be obtained from the owners of all 20 NSR properties, allowing the sound levels to exceed the 36 dBA limit.

As part of the current RFA, the Certificate Holder is proposing to upgrade the same final design locations represented in RFA 1 using a combination of GE 2.5-116 and GE 2.5-127 wind turbines. No modifications to the substation are proposed. The sound power emissions of the newer wind turbines are expected to be similar to the as-built wind turbines, each with a total sound power of 105 dBA at maximum rotation (see Attachment 6[6]). Advances in blade airfoil shape and manufacture have significantly reduced the noise from wind turbine blades. Similarly, attention to the sources of noise in wind turbine gearboxes has resulted in significant reductions. Therefore, in all likelihood, the newer wind turbine models proposed for the Facility will produce lower sound levels than the originally installed wind turbine models and associated noise impacts at NSRs are expected to be the same or less than those reported in RFA 1. Per Site Certificate Condition #98, the Certificate Holder will maintain a compliant response system to address noise complaints.

6.18 Removal-Fill Law

The Oregon Removal-Fill Law (ORS 196.795 through ORS 196.990) and Oregon Department of State Lands regulations (OAR 141-085- 0500 through OAR 141-085-0785) require a removal-fill permit if 50 cubic yards or more of material is removed, filled, or altered within any "waters of the state."

The Certificate Holder provided information regarding wetlands and other waters of the state in Exhibit J of the ASC (Caithness Shepherds Flat, LLC 2007). A removal-fill permit is not needed for RFA 2, because like Facility construction, the proposed changes will not temporarily or permanently impact waters of the state.

6.19 Water Rights

Under ORS Chapters 537 and 540 and OAR Chapter 690, the Oregon Water Resources Department (OWRD) administers the appropriation of water rights and regulates the use of the water resources of the state. The Council previously found that the facility would comply with the Ground Water Act of 1955 and the rules of OWRD (ODOE 2008, ODOE 2009, ODOE 2010). The upgrade does not alter the Certificate Holder's ability to obtain water from the City of Arlington (see Attachment 5) during construction, nor its intended use of less than 5,000 gallons per day of water from an on-site well during operations (per Condition 78). Water required for the upgrade will be less than what was previously approved for Facility construction because water will not be need for the turbine

[6] By email confirmation from GE, it was confirmed that documents provided to support the permitting process do not need to be handled confidentially. However, the document is proprietary and cannot be copied without written consent from GE.

foundations and there will be less water needed for dust control. The Certificate Holder conservatively anticipates the expected average amount of gallons used per day for dust suppression and road compaction during construction would be 50,000 gallons (or approximately 30 million gallons total) of water for upgrading activities for all three Shepherds Flat Wind Farm facilities. The City of Arlington has confirmed they can provide that volume of water (see Attachment 5). There will be no changes to operational water use. Therefore, the modification proposed under RFA 2 does not exceed or alter the amount of water or procurement sources from what has been permitted for the Facility, and the Council may rely on its prior findings that the Facility complies with the Ground Water Act of 1955 and the rules of OWRD.

7.0 Property Owners Located within or Adjacent to the Site of the Facility – OAR 345-027-0060(1)(f)

(1) To request an amendment to the site certificate required by OAR 345-027-0050(3) and (4), the certificate holder shall submit a written preliminary request for amendment to the Department of Energy that includes the following:

** * **

(f) An updated list of the owners of property located within or adjacent to the site of the facility, as described in OAR 345-021-0010(1)(f). Property adjacent to the site boundary means property that is: (C) Within 500 feet of the site boundary where the site, corridor or micrositing corridor is within a farm or forest zone.

An updated list and associated map of property owners is provided to ODOE under a separate cover.

8.0 Conclusion

Based on the findings and conclusions discussed above regarding the proposed change in RFA 2, the Council can make the following findings:

1. RFA 2 complies with the requirements of the Oregon Energy Facility Siting Statutes, ORS 469.300 to ORS 469.570 and 469.590 to 469.619.
2. RFA 2 complies with the applicable standards adopted by the Council pursuant to ORS 469.501.
3. RFA 2 complies with all other Oregon statutes and administrative rules applicable to the amendment of the site certificate that are within the Council's jurisdiction.

Therefore, the Council may approve the Certificate Holder's RFA2 and Type B review path.

9.0 References

Adams, R., G. Thomas, J. Held, and T. Ozbun. 2008. Cultural Resource Survey for the Proposed Shepherds Flat Wind Farm Project, Gilliam and Morrow Counties, Oregon. Archaeological Investigations Northwest, Inc., Portland, Oregon. Submitted to Caithness Shepherds Flat, LLC, New York, New York. SHPO Survey Report #21721.

Alsup, S., and J. Smith. 2018a. Raptor Nesting Survey and Monitoring Report, 2017. Prepared by Bionomics Environmental, Inc. for North Hurlburt Wind, LLC. March 2018.

Alsup, S., and J. Smith. 2018b. Raptor Nest Survey and Monitoring Report: Shepherds Flat Central, 2017. Prepared for: South Hurlbut Wind, LLC. Prepared by: Bionomics Environmental Inc. March 2018.

Alsup, S., and J. Smith. 2018c. Raptor Nesting Survey and Monitoring Report, 2017. Prepared by Bionomics Environmental, Inc. for Horseshoe Bend Wind, LLC. March 2018.

AWWI (American Wind Wildlife Institute). 2017. Wind Turbine Interactions with Wildlife and Their Habitats – A Summary of Research Results and Priority Questions. 2017. American Wind Wildlife Institute 1110 Vermont Avenue, NW, Suite 950 Washington, DC 20005-3544.

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.

Brigham, R. M., J. Ng, R. G. Poulin, and S. D. Grindal. 2011. Common Nighthawk (*Chordeiles minor*), version 2.0. In *The Birds of North America* (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

Caithness Shepherds Flat, LLC. 2007. Application for a Site Certificate for the Shepherds Flat Wind Farm. Prepared for Oregon Energy Facility Siting Council. January 2007.

Csuti, B., T.A. O'Neil, M. M. Shaughnessey, and C. J. Hak. 2001. Atlas of Oregon Wildlife: Distribution, Habitat, and Natural History.

DePasqual, S. C., and N. Nickoloff. 2012. Archaeological and Historic Survey Addendum, Shepherds Flat Central Wind Farm Project. Bionomics Environmental, Inc., Eagle, Idaho. Submitted to Caithness Shepherds Flat, LLC. SHPO Survey Report #29399.

Everaert, J. 2014. Collision risk and micro-avoidance rates of birds with wind turbines in Flanders. Bird Study 61(2): 220-230.

Ellis, D. V., T. Ogle, and J. M. Allen. 2006. A Cultural Resource Overview of the Proposed Shepherds Flat Wind Farm Project, Gilliam and Morrow Counties, Oregon. Archaeological Investigations Northwest, Inc., Portland, Oregon. Submitted to LifeLine Renewable Energy, Inc., Sacramento, California. SHPO Survey Report #20535.

de Lucas, M., G. F. E. Janss, D. P. Whitfield and M. Ferrer 2008. Collision fatality of raptors in wind farms does not depend on raptor abundance. Journal of Applied Ecology 45(6): 1695-1703.

Horseshoe Bend Wind, LLC. 2009. Request to Amend the Site Certificate for Shepherds Flat Central. Prepared for Oregon Energy Facility Siting Council. November 2009.

Loss, S.R., T. Will, and P. Marra. 2013. Estimates of bird collision mortality at wind facilities in the contiguous United States. Biological Conservation 168:201-209.

Martin, J. W., and B. A. Carlson. 1998. Sagebrush Sparrow (*Artemisiospiza nevadensis*), version 2.0. In *The Birds of North America* (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA.

OCS (Oregon Conservation Strategy). 2016. Oregon Conservation Strategy species. Oregon Department of Fish and Wildlife, Salem, Oregon.

ODA (Oregon Department of Agriculture). 2018. Oregon Listed and Candidate Plants. Available online at: https://www.oregon.gov/ODA/programs/PlantConservation/Pages/AboutPlants.aspx. Accessed July 2019.

ODOE (Oregon Department of Energy). 2008. Final Order on the Application for Site Certificate for the Shepherds Flat Wind Farm. July 25, 2008.

ODOE. 2009. Final Order on Amendment 1 of the Site Certificate for the Shepherds Flat Wind Farm. September 11, 2009.

ODOE. 2010. Final Order on Amendment 1 of the Site Certificate for Shepherds Flat South. March 12, 2010.

ODOE. 2019. Draft Proposed Order on Amendment 2 of the Site Certificate for Shepherds Flat Central. September 24, 2019.

ODFW (Oregon Department of Fish and Wildlife). 2016. ODFW Sensitive Species List. Available online at: https://www.dfw.state.or.us/wildlife/diversity/species/docs/2017_Sensitive_Species_List.pdf. Accessed July 2019.

ODFW. 2018. Threatened, endangered and candidate fish and wildlife species. Available online at: http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_candidate_list.asp. Accessed July 2019.

ORBIC (Oregon Biodiversity Information Center). 2016. Rare, Threatened and Endangered Species of Oregon. Institute for Natural Resources, Portland State University, Portland, Oregon. 130 pp.

OWE (Oregon Wildlife Explorer). 2019. Available online at: http://oe.oregonexplorer.info/wildlife/wildlifeviewer/. Accessed July 2019.

Renewable Resources Consultants, LLC. 2009. Geotechnical Report Shepherds Flat Wind Project – Central Phase Interstate 84 and Highway 74; Gilliam County, Oregon.

Rotenberry, J. T., M. A. Patten, and K. L. Preston. 1999. Brewer's Sparrow (*Spizella breweri*), version 2.0. In *The Birds of North America* (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.

Shannon & Wilson, Inc. 2007. Seismic Hazard Assessment: Shepherds Flat Wind Project; Arlington, OR.

Smith, J. R., S. E. Alsup, and R. Remington. 2015a. Shepherds Flat North Wind Facility Technical Report. Bird and Bat Mortality Estimates. Prepared by Bionomics Environmental, Inc. and Quantified, Inc. for North Hurlburt Wind, LLC. April 24, 2015.

Smith, J. R., S. E. Alsup, and R. Remington. 2015b. Shepherds Flat Central Wind Facility Technical Report. Bird and Bat Mortality Estimates. 2015b. Prepared by Bionomics Environmental, Inc. and Quantified, Inc. for South Hurlburt Wind, LLC. April 24, 2015.

Smith, J. R., S. E. Alsup, and R. Remington. 2015c. Shepherds Flat South Wind Facility Technical Report. Bird and Bat Mortality Estimates. 2015c. Prepared by Bionomics Environmental, Inc. and Quantified, Inc. for Horseshoe Bend Wind, LLC. April 24, 2015.

South Hurlburt Wind, LLC. 2009. Request to Amend the Site Certificate for Shepherds Flat Central. Prepared for Oregon Energy Facility Siting Council. November 2009.

Sullivan, B.L., C.L. Wood, M.J. Iliff, R.E. Bonney, D. Fink, and S. Kelling. 2009. eBird: a citizen-based bird observation network in the biological sciences. *Biological Conservation* 142: 2282-2292.

U.S. Census Bureau. 2010. Online Census Results. American Fact Finder. Available online at: http://factfinder.census.gov. Accessed July 2019.

U.S. Census Bureau. 2017. American Community Survey 5-Year Estimates. Available online at: http://factfinder.census.gov. Accessed July 2019.

USFWS (United States Fish and Wildlife Service). 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. Available online at: https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf Accessed September 2018.

USFWS. 2019. Federally Listed, Proposed, Candidate, Delisted Species and Species of Concern Under the Jurisdiction of the Fish and Wildlife Service which May Occur in Oregon. Available online at: https://www.fws.gov/oregonfwo/Documents/OregonSpeciesStateList.pdf. Accessed July 2010.

Weisskopf, C. P., R. Welch, and L. Schleder. 2014a. Raptor Searches of SF North, 2013. Prepared for North Hurlburt Wind, LLC. February 2014.

Weisskopf, C. P., R. Welch, and L. Schleder. 2014b. Raptor Searches of SF Central, 2013. Prepared for South Hurlburt Wind, LLC. February 2014.

Weisskopf, C. P., R. Welch, and L. Schleder. 2014c. Raptor Searches of SF South, 2013. Prepared for Horseshoe Bend Wind, LLC. February 2014.

Zimmerling, J. R. and C. M. Francis. 2016. Bat mortality due to wind turbines in Canada. Journal of Wildlife Management 80: 1360-1369. doi:10.1002/jwmg.21128.

Figures

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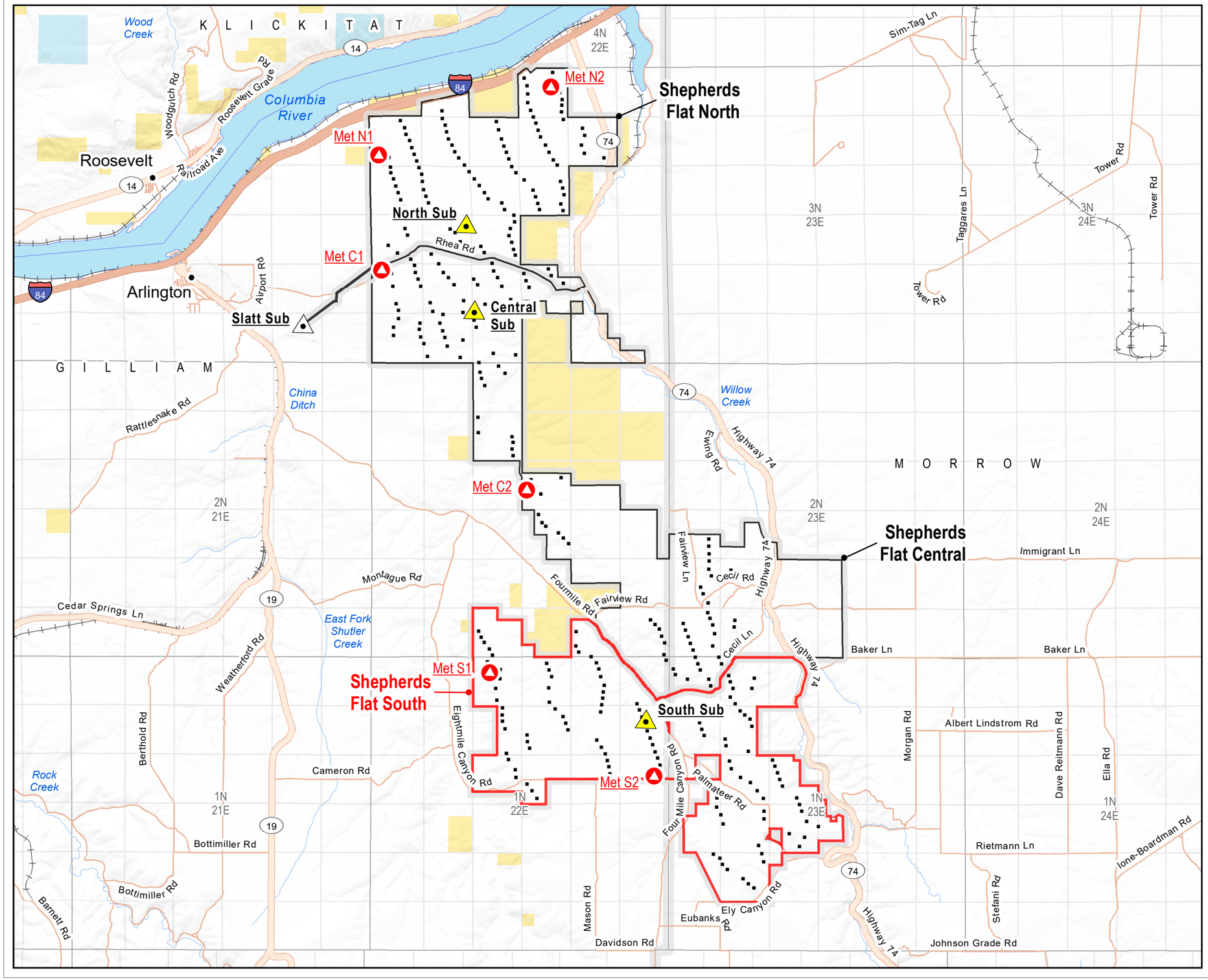
Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 1
Facility Location



Site Boundaries
- Shepherds Flat South
- Shepherds Flat North and Central

Facilities
- Wind Turbines
- Met Towers
- Substations
- Other Substation

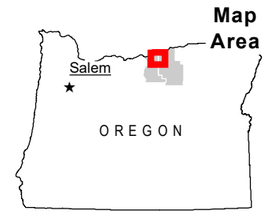
Land Status
- Bureau of Land Management
- Military Reservation or Corps of Engineers
- Private
- State or Local
- Water

Disclaimer:
Not intended for construction, or any uses other than intended purpose.

Data Source(s):
BLM, Caithness Energy, Esri, USGS

0 2
Miles

Map Area



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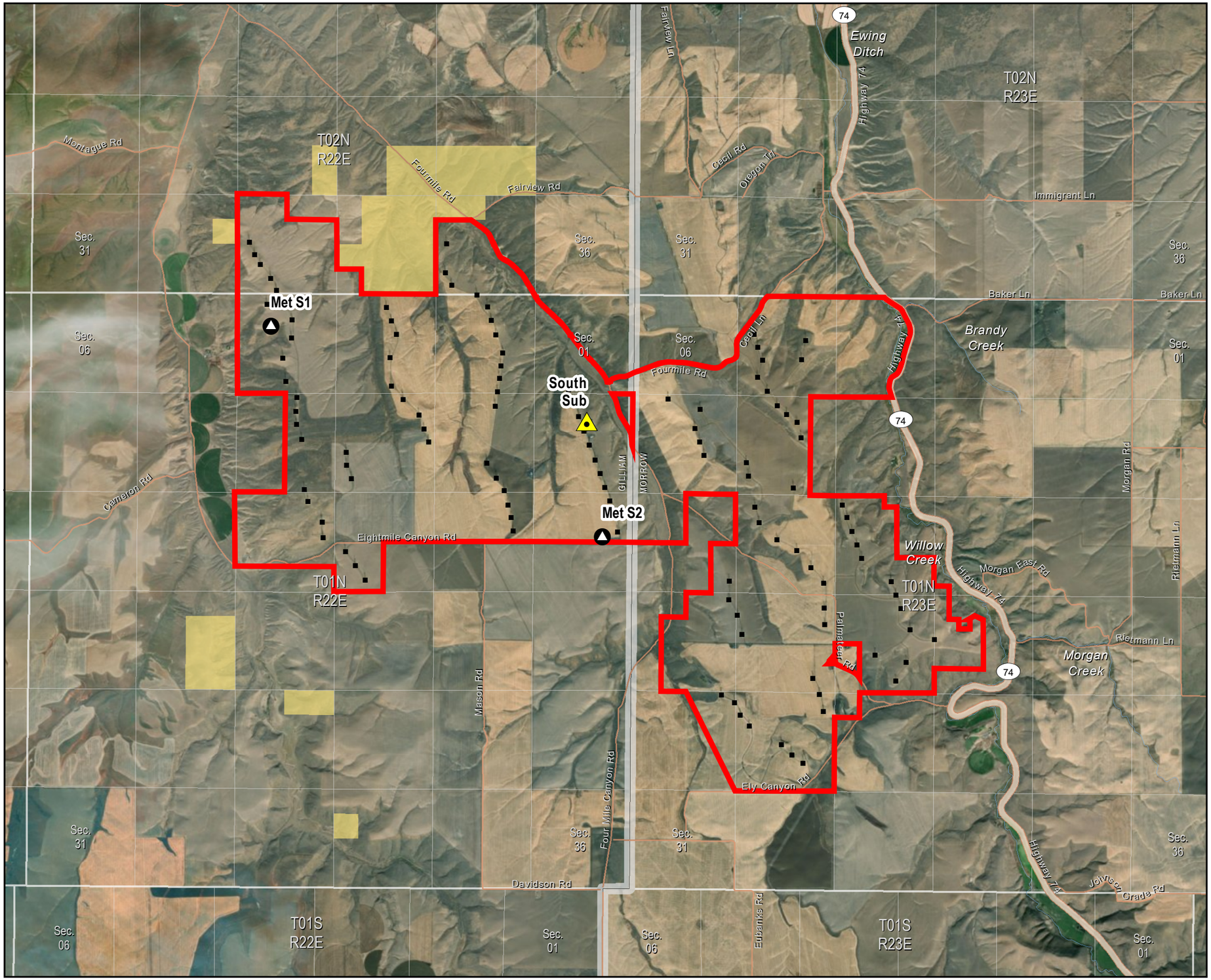
Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 2
Turbine and Other Facility Locations



Facilities

- Shepherds Flat South (Site Boundary)
- Wind Turbines
- Met Towers
- South Substation

Land Status

- Bureau of Land Management
- Private

Notes:
Not intended for construction, or any uses other than intended purpose.

Data Source(s):
BLM, Caithness Energy, Esri, StreamNet, USGS

0 1
Miles

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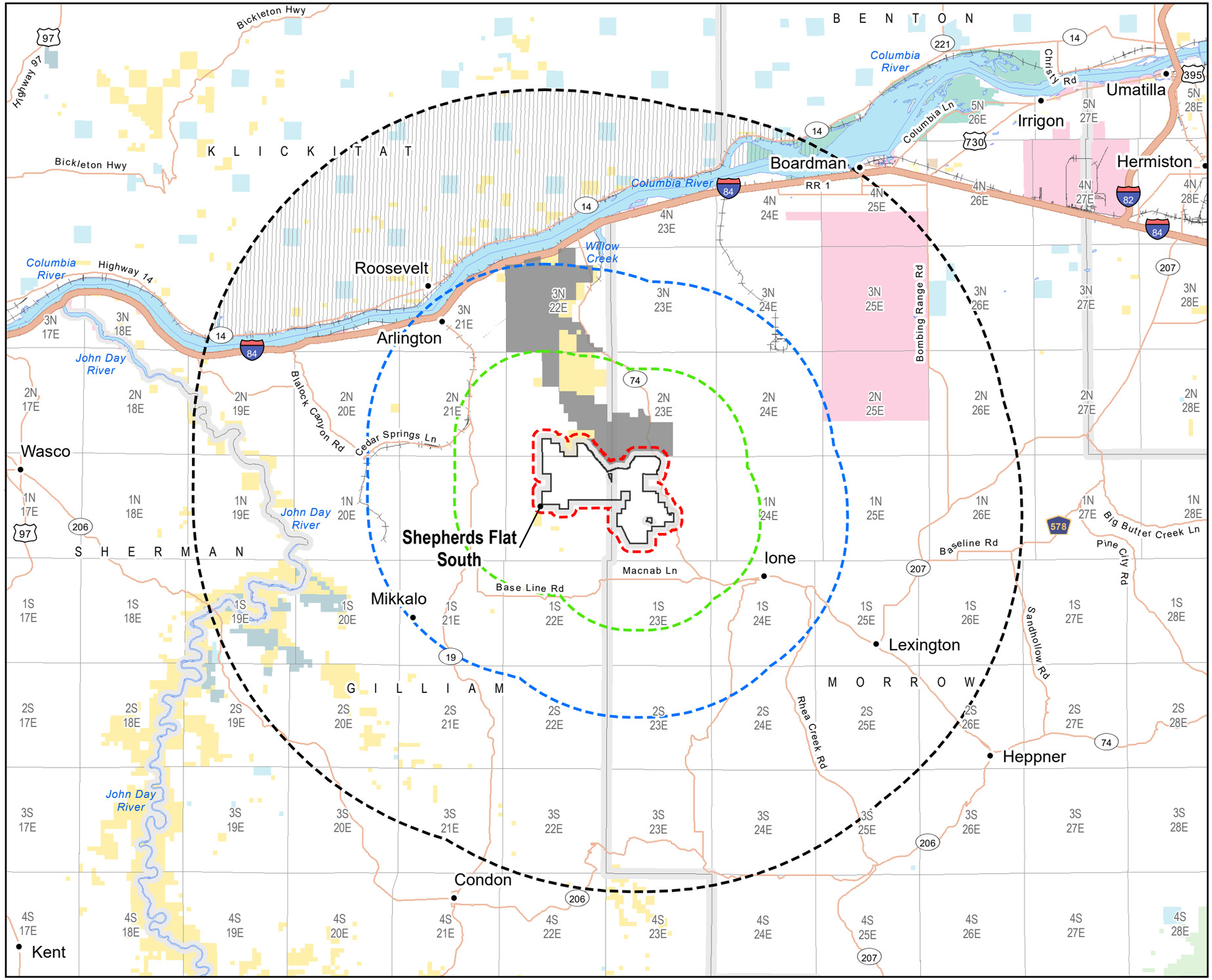
Z:\UtilServ\Shepherds Flat\Reports\FIG 2\FIG 2 Detail_SOUTH.mxd 9/23/2019

Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 3
Analysis Areas



Site Boundaries
- Shepherds Flat South
- Shepherds Flat North and Central

Analysis Areas
- Fish and Widlife (0.5-miles)
- TES and Recreational Opportunities (5-miles)
- Scenic Resources (10-miles)
- Protected Areas (20-miles)
- Not Included in Analysis Area (not in Oregon)

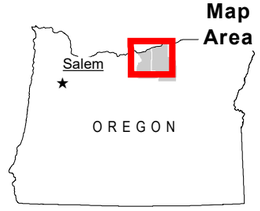
Land Status
- Bureau of Land Management
- Bureau of Reclamation
- Fish and Wildlife Service
- Forest Service
- Military Reservation or Corps of Engineers
- Other Federal
- Private
- State or Local
- State or Local Parks and Recreation or Wildlife
- Water

Notes:
Not intended for construction, or any uses other than intended purpose.

Data Source(s):
BLM, Caithness Energy, Esri, USGS

0 5
Miles

Map Area



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Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 4-1
Limits of
Temporary Work Areas*

Habitat Categorization (pre-construction)

- 2 Raptor nest
- 2 Wetlands-dry washes
- 3 Grassland
- 3 Previously cultivated
- 3 Shrub-steppe (rabbitbrush)
- 3 Shrub-steppe (sage-steppe)
- 4 Grassland
- 4 Previously cultivated
- 4 Rock and sand
- 5 Previously cultivated
- 6 Dryland wheat
- 6 Roads and parking

Facilities

- Shepherds Flat South (Site Boundary)
- Temporary Work Areas
- Met Towers

Notes:
Not intended for construction, or any uses other than intended purpose.

* Temporary work areas are adjacent to existing permanent access roads and turbine pads.

Data Source(s):
Caithness Energy, Esri, USGS

Base Map:
Copyright:© 2013 National Geographic Society, i-cubed

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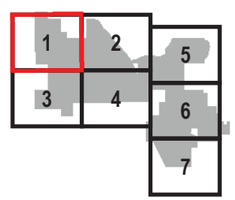

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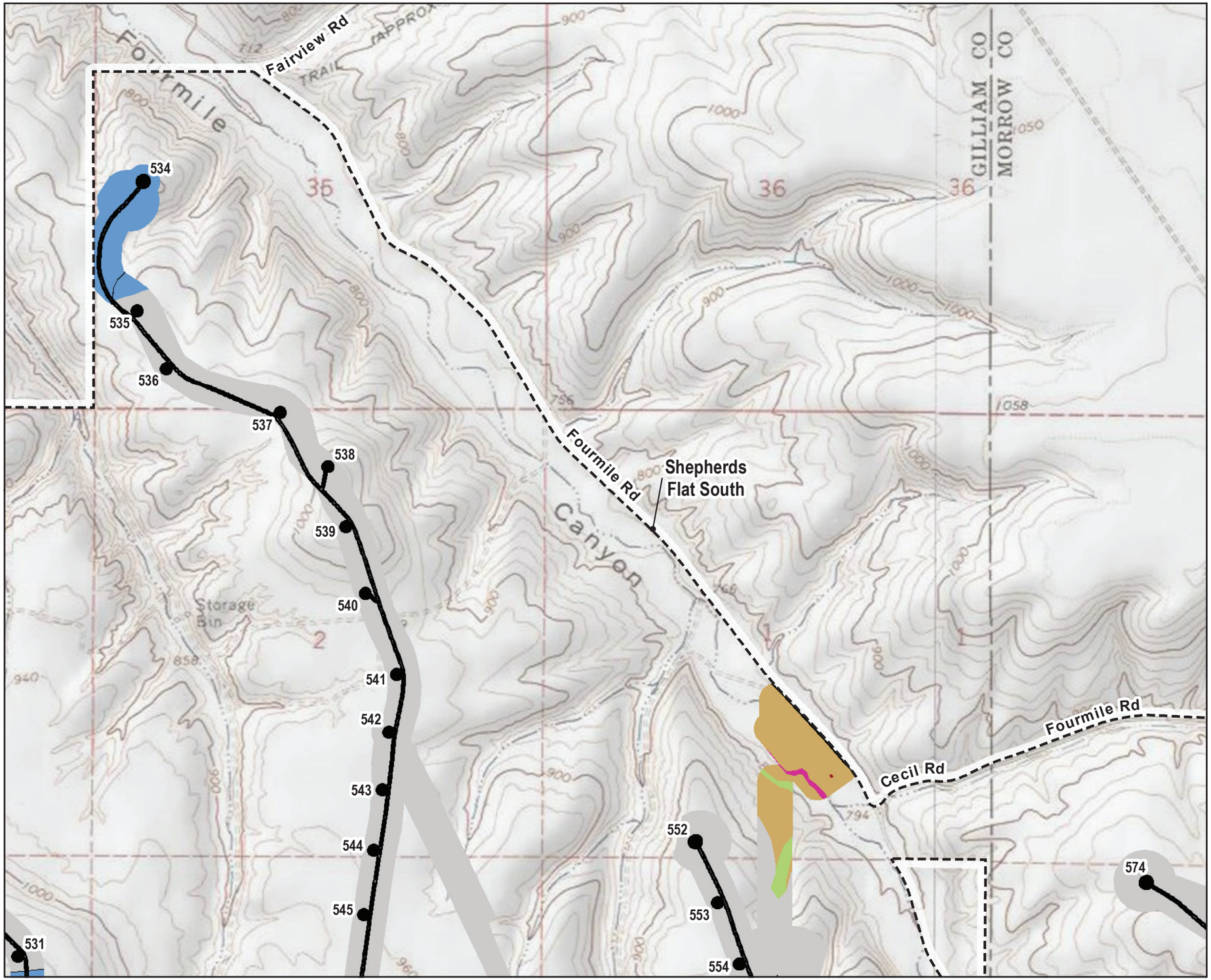
Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 4-2
Limits of
Temporary Work Areas*



Habitat Categorization (pre-construction)

- 1 Raptor nest
- 2 Raptor nest
- 2 Wetlands-dry washes
- 3 Grassland
- 3 Previously cultivated
- 3 Shrub-steppe (rabbitbrush)
- 3 Shrub-steppe (sage-steppe)
- 4 Grassland
- 4 Previously cultivated
- 5 Previously cultivated
- 6 Dryland wheat
- 6 Roads and parking
- 6 Structures

Facilities

- Shepherds Flat South (Site Boundary)
- Temporary Work Areas
- South Substation

Notes:
Not intended for construction, or any uses other than intended purpose.

* Temporary work areas are adjacent to existing permanent access roads and turbine pads.

Data Source(s):
Caithness Energy, Esri, USGS

Base Map:
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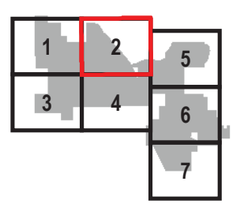

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Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 4-3
Limits of
Temporary Work Areas*

Shepherds Flat South
Canyon
Cameron Rd
Eightmile Canyon Rd
513
514
515
516
517
518
519
520
521
522
523
524

Habitat Categorization (pre-construction)

- 2 Raptor nest
- 2 Wetlands-dry washes
- 3 Grassland
- 3 Previously cultivated
- 3 Shrub-steppe (rabbitbrush)
- 3 Shrub-steppe (sage-steppe)
- 4 Grassland
- 4 Previously cultivated
- 4 Rock and sand
- 5 Previously cultivated
- 6 Dryland wheat
- 6 Roads and parking

Facilities

- Shepherds Flat South (Site Boundary)
- Temporary Work Areas

Notes:
Not intended for construction, or any uses other than intended purpose.

* Temporary work areas are adjacent to existing permanent access roads and turbine pads.

Data Source(s):
Caithness Energy, Esri, USGS

Base Map:

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Feet

1 2 3 4 5 6 7

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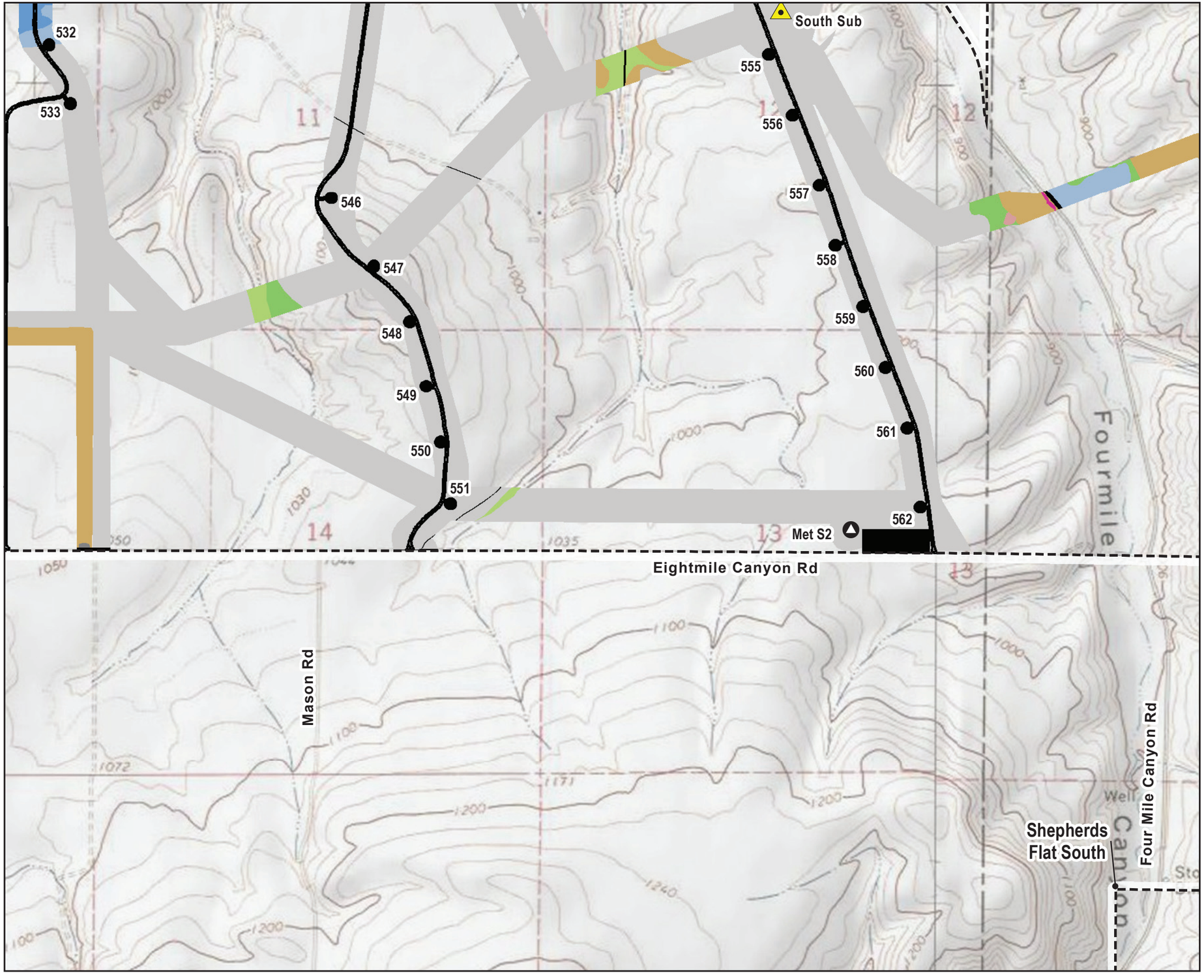
Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 4-4
Limits of
Temporary Work Areas*



Habitat Categorization
(pre-construction)

- 2 Raptor nest
- 2 Wetlands-dry washes
- 3 Grassland
- 3 Previously cultivated
- 3 Shrub-steppe (rabbitbrush)
- 3 Shrub-steppe (sage-steppe)
- 4 Grassland
- 4 Previously cultivated
- 5 Previously cultivated
- 6 Dryland wheat
- 6 Roads and parking
- 6 Structures

Facilities

- Shepherds Flat South (Site Boundary)
- Temporary Work Areas
- Met Towers
- South Substation

Notes:
Not intended for construction, or any uses other than intended purpose.

* Temporary work areas are adjacent to existing permanent access roads and turbine pads.

Data Source(s):
Caithness Energy, Esri, USGS

Base Map:
Copyright:© 2013 National Geographic Society, i-cubed

CAITHNESS

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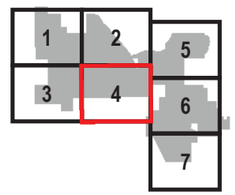

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Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 4-5
Limits of
Temporary Work Areas*

Habitat Categorization (pre-construction)

- 3 Grassland
- 3 Previously cultivated
- 3 Shrub-steppe (rabbitbrush)
- 3 Shrub-steppe (sage-steppe)
- 4 Grassland
- 4 Previously cultivated
- 5 Previously cultivated
- 6 Dryland wheat
- 6 Roads and parking

Facilities

- Shepherds Flat South (Site Boundary)
- Temporary Work Areas

Notes:
Not intended for construction, or any uses other than intended purpose.

* Temporary work areas are adjacent to existing permanent access roads and turbine pads.

Data Source(s):
Caithness Energy, Esri, USGS

Base Map:
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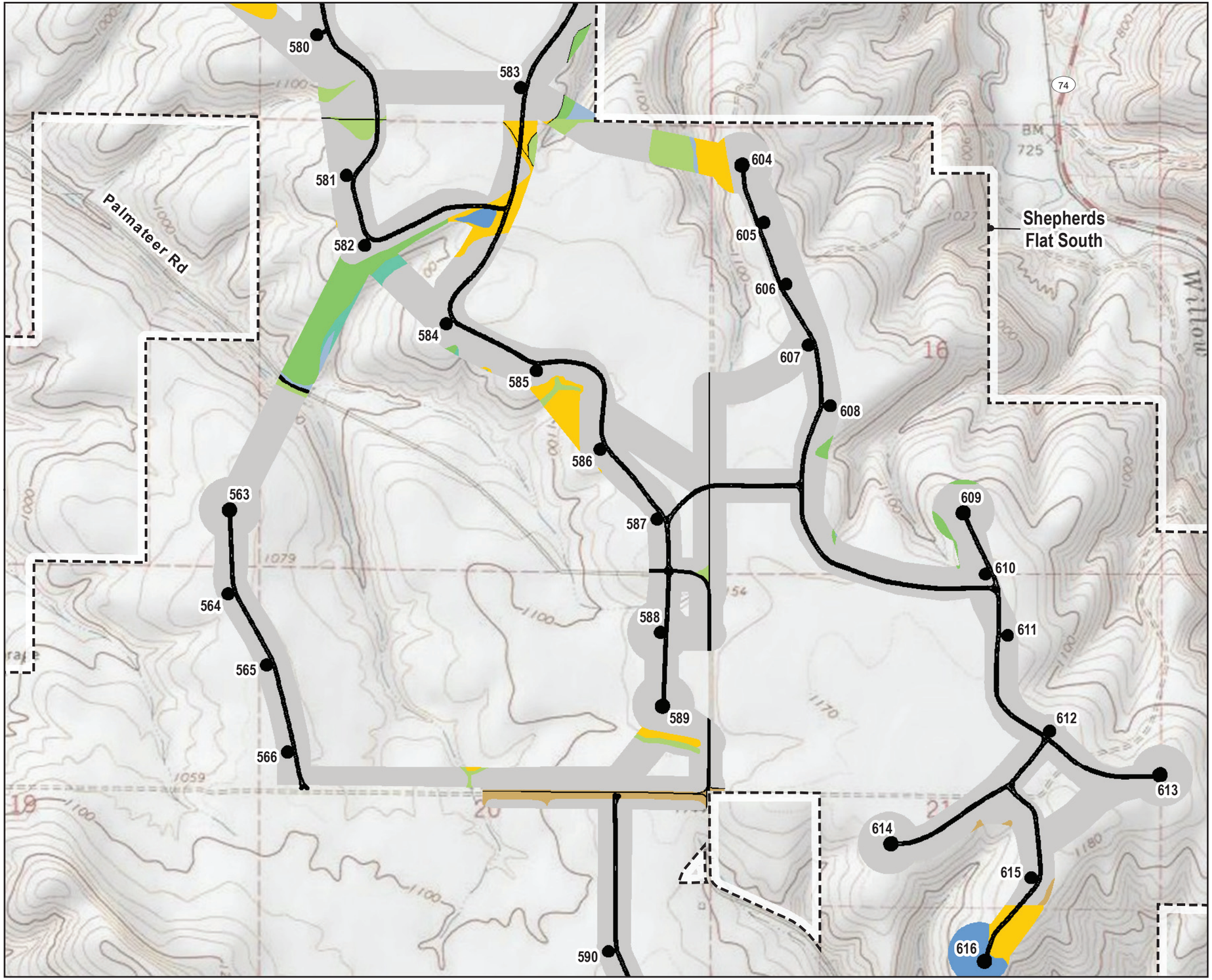
Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 4-6
Limits of
Temporary Work Areas*



Habitat Categorization (pre-construction)

- 3 Grassland
- 3 Previously cultivated
- 3 Shrub-steppe (rabbitbrush)
- 3 Shrub-steppe (sage-steppe)
- 4 Grassland
- 4 Previously cultivated
- 5 Previously cultivated
- 6 Dryland wheat
- 6 Roads and parking

Facilities

- Shepherds Flat South (Site Boundary)
- Temporary Work Areas

Notes:
Not intended for construction, or any uses other than intended purpose.

* Temporary work areas are adjacent to existing permanent access roads and turbine pads.

Data Source(s):
Caithness Energy, Esri, USGS

Base Map:

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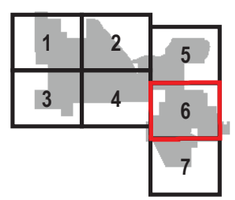
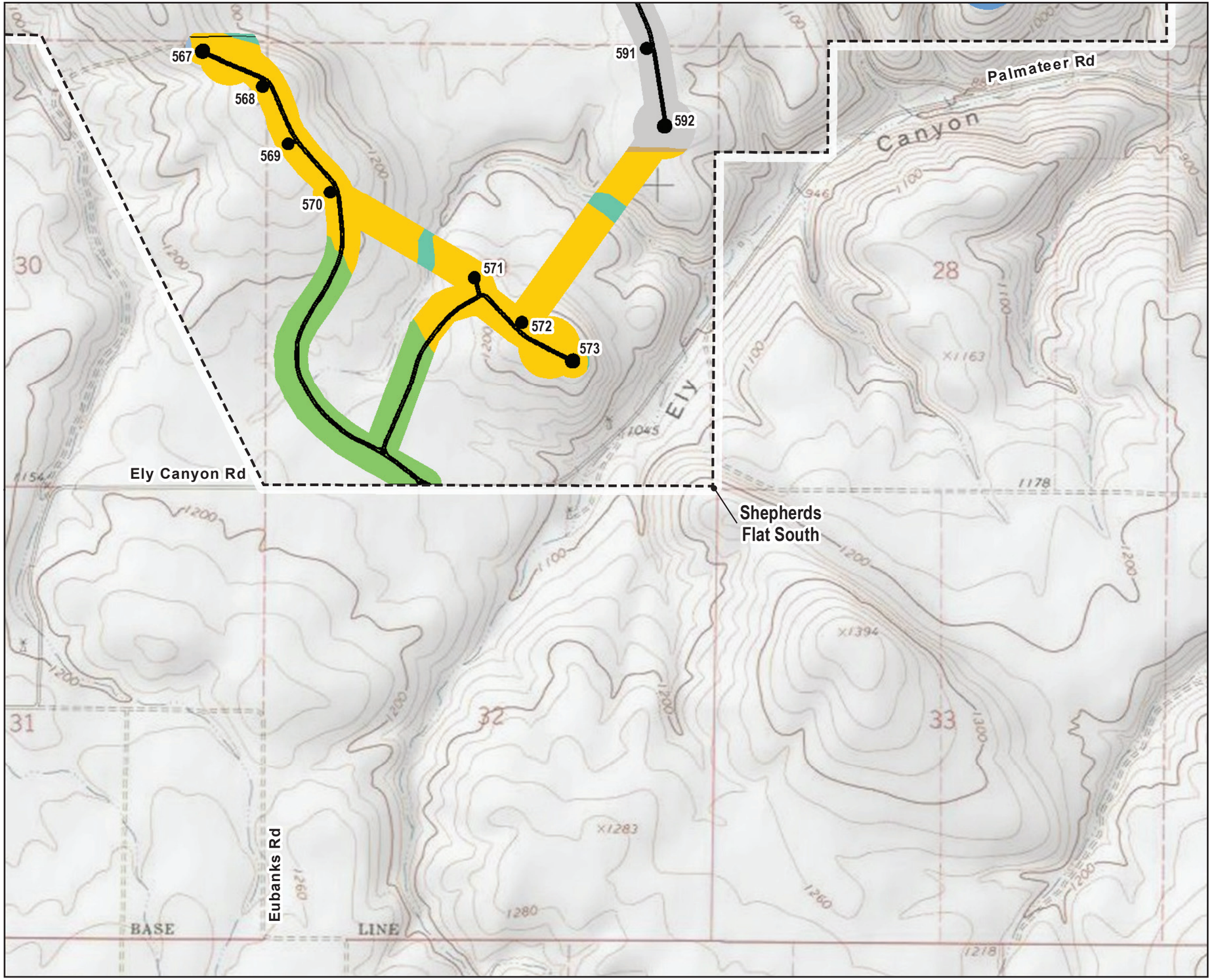


CAITHNESS

Z:\UtilServ\Shepherds Flat\Reports\FIG 4\FIG 4 Temporary Works Areas_SOUTH.mxd 10/7/2019

Horseshoe Bend Wind, LLC
Shepherds Flat South
Request For Amendment #2
Gilliam and Morrow County, Oregon

Figure 4-7
Limits of
Temporary Work Areas*



Habitat Categorization (pre-construction)
- 3 Grassland
- 3 Previously cultivated
- 3 Shrub-steppe (rabbitbrush)
- 3 Shrub-steppe (sage-steppe)
- 4 Previously cultivated
- 5 Previously cultivated
- 6 Dryland wheat
- 6 Roads and parking

Facilities
- Shepherds Flat South (Site Boundary)
- Temporary Work Areas

Notes:
Not intended for construction, or any uses other than intended purpose.

* Temporary work areas are adjacent to existing permanent access roads and turbine pads.

Data Source(s):
Caithness Energy, Esri, USGS

Base Map:
Copyright:© 2013 National Geographic Society, i-cubed

0 1,000
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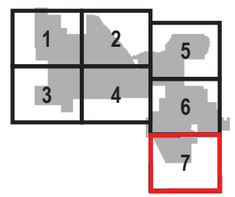

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Attachment 1. Red-line Site Certificate

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ENERGY FACILITY SITING COUNCIL

OF THE

STATE OF OREGON

~~First~~ Second Amended Site Certificate

for

Shepherds Flat South

~~March 12, 2010~~

December 2019

The Oregon Energy Facility Siting Council

SITE CERTIFICATE FOR SHEPHERDS FLAT SOUTH

I. INTRODUCTION

The Oregon Energy Facility Siting Council (Council) issues this site certificate for the Shepherds Flat South (the facility) in the manner authorized under ORS Chapter 469. This site certificate is a binding agreement between the State of Oregon (State), acting through the Council, and Horseshoe Bend Wind, LLC (certificate holder) authorizing the certificate holder to construct and operate the facility in Gilliam County and Morrow County, Oregon. [Amendment #1 for the Shepherds Flat Wind Farm (SFWF)]

The findings of fact, reasoning and conclusions of law underlying the terms and conditions of this site certificate are set forth in the following documents, incorporated herein by this reference: (a) the Council's *Final Order on the Application for the Shepherds Flat Wind Farm* issued on July 25, 2008, (b) the *Final Order on Amendment #1 for the Shepherds Flat Wind Farm*, and (c) the *Final Order on Amendment #1*. In interpreting this site certificate, any ambiguity will be clarified by reference to the following, in order of priority: (1) this First Amended Site Certificate, (2) the *Final Order on Amendment #1*, (3) the *Final Order on Amendment #1 for the Shepherds Flat Wind Farm*, (4) the *Final Order on the Application for the Shepherds Flat Wind Farm* and (5) the record of the proceedings that led to the Final Orders on the Application and Amendment #1 for the Shepherds Flat Wind Farm. [Amendment #1 (SFWF); Amendment #1]

[Text added by Amendment #1 (SFWF) was removed by Amendment #1].

The definitions in ORS 469.300 and OAR 345-001-0010 apply to terms used in this site certificate, except where otherwise stated or where the context clearly indicates otherwise.

II. SITE CERTIFICATION

1. To the extent authorized by state law and subject to the conditions set forth herein, the State authorizes the certificate holder to construct, operate and retire a wind energy facility, together with certain related or supporting facilities, at the site in Gilliam County and Morrow County, Oregon, as described in Section III of this site certificate. ORS 469.401(1).
2. This site certificate is effective until it is terminated under OAR 345-027-0110 or the rules in effect on the date that termination is sought or until the site certificate is revoked under ORS 469.440 and OAR 345-029-0100 or the statutes and rules in effect on the date that revocation is ordered. ORS 469.401(1).
3. This site certificate does not address, and is not binding with respect to, matters that were not addressed in the Council's Final Orders on the Application and Amendment #1 for the Shepherds Flat Wind Farm and in the *Final Order on Amendment #1*. Such matters include, but are not limited to: building code compliance, wage, hour and other labor regulations, local government fees and charges and other design or operational issues that do not relate to siting the facility (ORS 469.401(4)) and permits issued under statutes and rules for which the decision on compliance has been delegated by the federal government to a state agency other than the Council. 469.503(3). [Amendment #1 (SFWF); Amendment #1]

4. Both the State and the certificate holder shall abide by local ordinances, state law and the rules of the Council in effect on the date this site certificate is executed. ORS 469.401(2). In addition, upon a clear showing of a significant threat to public health, safety or the environment that requires application of later-adopted laws or rules, the Council may require compliance with such later-adopted laws or rules. ORS 469.401(2).

5. For a permit, license or other approval addressed in and governed by this site certificate, the certificate holder shall comply with applicable state and federal laws adopted in the future to the extent that such compliance is required under the respective state agency statutes and rules. ORS 469.401(2).

6. Subject to the conditions herein, this site certificate binds the State and all counties, cities and political subdivisions in Oregon as to the approval of the site and the construction, operation and retirement of the facility as to matters that are addressed in and governed by this site certificate. ORS 469.401(3).

7. Each affected state agency, county, city and political subdivision in Oregon with authority to issue a permit, license or other approval addressed in or governed by this site certificate shall, upon submission of the proper application and payment of the proper fees, but without hearings or other proceedings, issue such permit, license or other approval subject only to conditions set forth in this site certificate. ORS 469.401(3).

8. After issuance of this site certificate, each state agency or local government agency that issues a permit, license or other approval for the facility shall continue to exercise enforcement authority over such permit, license or other approval. ORS 469.401(3).

9. After issuance of this site certificate, the Council shall have continuing authority over the site and may inspect, or direct the Oregon Department of Energy (Department) to inspect, or request another state agency or local government to inspect, the site at any time in order to ensure that the facility is being operated consistently with the terms and conditions of this site certificate. ORS 469.430.

III. DESCRIPTION

1. The Facility

(a) The Energy Facility

The energy facility is an electric power generating facility with an average electric generating capacity of up to 97 megawatts and a peak generating capacity of not more than 290 megawatts that produces power from wind energy. The facility consists of not more than 116 wind turbines. The energy facility is described further in the *Final Order on Amendment #1 for the Shepherds Flat Wind Farm* and in the *Final Order on Amendment #1*. [Amendment #1 (SFWF); Amendment #1]

(b) Related or Supporting Facilities

The facility includes the following related or supporting facilities described below and in greater detail in the *Final Order on Amendment #1 for the Shepherds Flat Wind Farm* and in the *Final Order on Amendment #1*:

- Power Collection System
- Collector Substation

- Meteorological towers
- Field workshop
- Control system
- Access roads
- Additional construction areas

[Amendment #1 (SFWF); Amendment #1]

Power Collection System

A power collection system operating at 34.5 kilovolts (kV) transports power from each turbine to a collector substation. To the extent practicable, the collection system is installed underground at a depth of at least three feet. Segments of the collector system are aboveground. Aboveground segments are installed on single-pole, cross-arm structures. [Amendment #1]

Collector Substations and Interconnection

The facility includes a collector substation. The facility includes a 230-kV transmission line between the substation and the interconnection site. The interconnection site is located at the Bonneville Power Administration Slatt Switching Station. [Amendment #1 (SFWF)]

Meteorological Towers

The facility includes two permanent meteorological (met) towers. [Amendment #1 (SFWF)]

Field Workshop

The facility includes a field workshop. Including fenced areas, the field workshop occupies about 1.4 acres. [Amendment #1 (SFWF)]

Control System

A fiber optic communications network links the control panels within each wind turbine to a host computer located in the field workshop. Supervisory, Control and Data Acquisition (SCADA) systems at the field workshop collect operating and performance data from the turbines and the facility's met towers. [Amendment #1 (SFWF)]

Access Roads

The facility includes up to 27.5 miles of new roads that provide access to the turbine strings. The access roads connect to graveled turbine turnouts at the base of each turbine. [Amendment #1 (SFWF); Amendment #1]

Temporary Construction Areas

During construction, the facility includes temporary laydown areas used to stage construction and store supplies and equipment. The facility includes construction crane paths to move construction cranes between turbine strings.

2. Location of the Facility

The facility is located in Morrow County and Gilliam County south of Interstate Highway 84 and east of Arlington, Oregon, between State Highways 19 and 74. The facility is located entirely on private land subject to long-term wind energy leases. [Amendment #1 (SFWF)]

IV. CONDITIONS REQUIRED BY COUNCIL RULES

This section lists conditions required by OAR 345-027-0020 (Mandatory Conditions in Site Certificates), OAR 345-027-0023 (Site Specific Conditions), OAR 345-027-0028 (Monitoring Conditions) and OAR Chapter 345, Division 26 (Construction and Operation Rules for Facilities). These conditions should be read together with the specific facility conditions listed in Section V to ensure compliance with the siting standards of OAR Chapter 345, Divisions 22 and 24, and to protect the public health and safety. In these conditions, the definitions in OAR 345-001-0010 apply.

The obligation of the certificate holder to report information to the Department or the Council under the conditions listed in this section and in Section V is subject to the provisions of ORS 192.502 *et seq*. and ORS 469.560. To the extent permitted by law, the Department and the Council will not publicly disclose information that may be exempt from public disclosure if the certificate holder has clearly labeled such information and stated the basis for the exemption at the time of submitting the information to the Department or the Council. If the Council or the Department receives a request for the disclosure of the information, the Council or the Department, as appropriate, will make a reasonable attempt to notify the certificate holder and will refer the matter to the Attorney General for a determination of whether the exemption is applicable, pursuant to ORS 192.450.

In addition to these conditions, the site certificate holder is subject to all conditions and requirements contained in the rules of the Council and in local ordinances and state law in effect on the date the certificate is executed. Under ORS 469.401(2), upon a clear showing of a significant threat to the public health, safety or the environment that requires application of later-adopted laws or rules, the Council may require compliance with such later-adopted laws or rules.

The Council recognizes that many specific tasks related to the design, construction, operation and retirement of the facility will be undertaken by the certificate holder's agents or contractors. Nevertheless, the certificate holder is responsible for ensuring compliance with all provisions of the site certificate.

1 OAR 345-027-0020(1): The Council shall not change the conditions of the site certificate except as provided for in OAR Chapter 345, Division 27.

2 OAR 345-027-0020(2): The certificate holder shall submit a legal description of the site to the Department of Energy within 90 days after beginning operation of the facility. The legal description required by this rule means a description of metes and bounds or a description of the site by reference to a map and geographic data that clearly and specifically identifies the outer boundaries that contain all parts of the facility.

3 OAR 345-027-0020(3): The certificate holder shall design, construct, operate and retire the facility:

(a) Substantially as described in the site certificate;

(b) In compliance with the requirements of ORS Chapter 469, applicable Council rules, and applicable state and local laws, rules and ordinances in effect at the time the site certificate is issued; and

(c) In compliance with all applicable permit requirements of other state agencies.

4 OAR 345-027-0020(4): The certificate holder shall begin and complete construction of the facility by the dates specified in the site certificate. *(See Conditions 24 and 25.)*

5 OAR 345-027-0020(5): Except as necessary for the initial survey or as otherwise allowed for wind energy facilities, transmission lines or pipelines under this section, the certificate holder shall not begin construction, as defined in OAR 345-001-0010, or create a clearing on any part of the site until the certificate holder has construction rights on all parts of the site. For the purpose of this rule, "construction rights" means the legal right to engage in construction activities. For wind energy facilities, transmission lines or pipelines, if the certificate holder does not have construction rights on all parts of the site, the certificate holder may nevertheless begin construction, as defined in OAR 345-001-0010, or create a clearing on a part of the site if the certificate holder has construction rights on that part of the site and:

(a) The certificate holder would construct and operate part of the facility on that part of the site even if a change in the planned route of the transmission line or pipeline occurs during the certificate holder's negotiations to acquire construction rights on another part of the site; or

(b) The certificate holder would construct and operate part of a wind energy facility on that part of the site even if other parts of the facility were modified by amendment of the site certificate or were not built.

6 OAR 345-027-0020(6): If the Council requires mitigation based on an affirmative finding under any standards of Division 22 or Division 24 of this chapter, the certificate holder shall consult with affected state agencies and local governments designated by the Council and shall develop specific mitigation plans consistent with Council findings under the relevant standards. The certificate holder must submit the mitigation plans to the Office and receive Office approval before beginning construction or, as appropriate, operation of the facility.

7 OAR 345-027-0020(7): The certificate holder shall prevent the development of any conditions on the site that would preclude restoration of the site to a useful, non-hazardous condition to the extent that prevention of such site conditions is within the control of the certificate holder.

8 OAR 345-027-0020(8): Before beginning construction of the facility, the certificate holder shall submit to the State of Oregon, through the Council, a bond or letter of credit, in a form and amount satisfactory to the Council to restore the site to a useful, non-hazardous condition. The certificate holder shall maintain a bond or letter of credit in effect at all times until the facility has been retired. The Council may specify different amounts for the bond or letter of credit during construction and during operation of the facility. *(See Condition 30.)*

9 OAR 345-027-0020(9): The certificate holder shall retire the facility if the certificate holder permanently ceases construction or operation of the facility. The certificate holder shall retire the facility according to a final retirement plan approved by the Council, as described in OAR 345-027-0110. The certificate holder shall pay the actual cost to restore the site to a useful, non-hazardous condition at the time of retirement, notwithstanding the Council's approval in the site certificate of an estimated amount required to restore the site.

10 OAR 345-027-0020(10): The Council shall include as conditions in the site certificate all representations in the site certificate application and supporting record the Council deems to be binding commitments made by the applicant.

11 OAR 345-027-0020(11): Upon completion of construction, the certificate holder shall restore vegetation to the extent practicable and shall landscape all areas disturbed by construction in a manner compatible with the surroundings and proposed use. Upon completion of construction, the certificate holder shall remove all temporary structures not required for facility operation and dispose of all timber, brush, refuse and flammable or combustible material resulting from clearing of land and construction of the facility.

12 OAR 345-027-0020(12): The certificate holder shall design, engineer and construct the facility to avoid dangers to human safety presented by seismic hazards affecting the site that are expected to result from all maximum probable seismic events. As used in this rule "seismic hazard" includes ground shaking, landslide, liquefaction, lateral spreading, tsunami inundation, fault displacement and subsidence.

13 OAR 345-027-0020(13): The certificate holder shall notify the Department, the State Building Codes Division and the Department of Geology and Mineral Industries promptly if site investigations or trenching reveal that conditions in the foundation rocks differ significantly from those described in the application for a site certificate. After the Department receives the notice, the Council may require the certificate holder to consult with the Department of Geology and Mineral Industries and the Building Codes Division and to propose mitigation actions.

14 OAR 345-027-0020(14): The certificate holder shall notify the Department, the State Building Codes Division and the Department of Geology and Mineral Industries promptly if shear zones, artesian aquifers, deformations or clastic dikes are found at or in the vicinity of the site.

15 OAR 345-027-0020(15): Before any transfer of ownership of the facility or ownership of the site certificate holder, the certificate holder shall inform the Department of the proposed new owners. The requirements of OAR 345-027-0100 apply to any transfer of ownership that requires a transfer of the site certificate.

16 OAR 345-027-0020(16): If the Council finds that the certificate holder has permanently ceased construction or operation of the facility without retiring the facility according to a final retirement plan approved by the Council, as described in OAR 345-027-0110, the Council shall notify the certificate holder and request that the certificate holder submit a proposed final retirement plan to the Office within a reasonable time not to exceed 90 days. If the certificate holder does not submit a proposed final retirement plan by the specified date, the Council may direct the Department to prepare a proposed final retirement plan for the Council's approval. Upon the Council's approval of the final retirement plan, the Council may draw on the bond or letter of credit described in OAR 345-027-0020(8) to restore the site to a useful, non-hazardous condition according to the final retirement plan, in addition to any penalties the Council may impose under OAR Chapter 345, Division 29. If the amount of the bond or letter of credit is insufficient to pay the actual cost of retirement, the certificate holder shall pay any additional cost necessary to restore the site to a useful, non-hazardous condition. After completion of site restoration, the Council shall issue an order to terminate the site certificate if the Council finds that the facility has been retired according to the approved final retirement plan.

17 OAR 345-027-0023(4): If the facility includes any transmission line under Council jurisdiction:

(a) The certificate holder shall design, construct and operate the transmission line in accordance with the requirements of the National Electrical Safety Code (American National Standards Institute, Section C2, 1997 Edition); and

(b) The certificate holder shall develop and implement a program that provides reasonable assurance that all fences, gates, cattle guards, trailers, or other objects or structures of a permanent nature that could become inadvertently charged with electricity are grounded or bonded throughout the life of the line.

18 OAR 345-027-0023(5): If the proposed energy facility is a pipeline or a transmission line or has, as a related or supporting facility, a pipeline or transmission line, the Council shall specify an approved corridor in the site certificate and shall allow the certificate holder to construct the pipeline or transmission line anywhere within the corridor, subject to the conditions of the site certificate. If the applicant has analyzed more than one corridor in its application for a site certificate, the Council may, subject to the Council's standards, approve more than one corridor.

19 OAR 345-027-0028: The following general monitoring conditions apply:

(a) The certificate holder shall consult with affected state agencies, local governments and tribes and shall develop specific monitoring programs for impacts to resources protected by the standards of divisions 22 and 24 of OAR Chapter 345 and resources addressed by applicable statutes, administrative rules and local ordinances. The certificate holder must submit the monitoring programs to the Department of Energy and receive Department approval before beginning construction or, as appropriate, operation of the facility.

(b) The certificate holder shall implement the approved monitoring programs described in OAR 345-027-0028(1) and monitoring programs required by permitting agencies and local governments.

(c) For each monitoring program described in OAR 345-027-0028(1) and (2), the certificate holder shall have quality assurance measures approved by the Department before beginning construction or, as appropriate, before beginning commercial operation.

(d) If the certificate holder becomes aware of a significant environmental change or impact attributable to the facility, the certificate holder shall, as soon as possible, submit a written report to the Department describing the impact on the facility and any affected site certificate conditions.

20 OAR 345-026-0048: Following receipt of the site certificate or an amended site certificate, the certificate holder shall implement a plan that verifies compliance with all site certificate terms and conditions and applicable statutes and rules. As a part of the compliance plan, to verify compliance with the requirement to begin construction by the date specified in the site certificate, the certificate holder shall report promptly to the Department of Energy when construction begins. Construction is defined in OAR 345-001-0010. In reporting the beginning of construction, the certificate holder shall describe all work on the site performed before beginning construction, including work performed before the Council issued the site certificate, and shall state the cost of that work. For the purpose of this exhibit, "work on the site" means any work within a site or corridor, other than surveying, exploration or other activities to define or characterize the site or corridor. The certificate

holder shall document the compliance plan and maintain it for inspection by the Department or the Council.

21 OAR 345-026-0080: The certificate holder shall report according to the following requirements:

(a) General reporting obligation for energy facilities under construction or operating:

(i) Within six months after beginning construction, and every six months thereafter during construction of the energy facility and related or supporting facilities, the certificate holder shall submit a semiannual construction progress report to the Department of Energy. In each construction progress report, the certificate holder shall describe any significant changes to major milestones for construction. The certificate holder shall include such information related to construction as specified in the site certificate. When the reporting date coincides, the certificate holder may include the construction progress report within the annual report described in OAR 345-026-0080.

(ii) By April 30 of each year after beginning construction, the certificate holder shall submit an annual report to the Department addressing the subjects listed in OAR 345-026-0080. The Council Secretary and the certificate holder may, by mutual agreement, change the reporting date.

(iii) To the extent that information required by OAR 345-026-0080 is contained in reports the certificate holder submits to other state, federal or local agencies, the certificate holder may submit excerpts from such other reports to satisfy this rule. The Council reserves the right to request full copies of such excerpted reports.

(b) In the annual report, the certificate holder shall include the following information for the calendar year preceding the date of the report:

(i) Facility Status: An overview of site conditions, the status of facilities under construction, and a summary of the operating experience of facilities that are in operation. In this section of the annual report, the certificate holder shall describe any unusual events, such as earthquakes, extraordinary windstorms, major accidents or the like that occurred during the year and that had a significant adverse impact on the facility.

(ii) Reliability and Efficiency of Power Production: For electric power plants, the plant availability and capacity factors for the reporting year. The certificate holder shall describe any equipment failures or plant breakdowns that had a significant impact on those factors and shall describe any actions taken to prevent the recurrence of such problems.

(iii) Fuel Use: For thermal power plants:

(A) The efficiency with which the power plant converts fuel into electric energy. If the fuel chargeable to power heat rate was evaluated when the facility was sited, the certificate holder shall calculate efficiency using the same formula and assumptions, but using actual data; and

(B) The facility's annual hours of operation by fuel type and, every five years after beginning operation, a summary of the annual hours of operation by fuel type as described in OAR 345-024-0590(5).

(iv) Status of Surety Information: Documentation demonstrating that bonds or letters of credit as described in the site certificate are in full force and effect and will remain in full force and effect for the term of the next reporting period.

(v) Monitoring Report: A list and description of all significant monitoring and mitigation activities performed during the previous year in accordance with site certificate terms and conditions, a summary of the results of those activities and a discussion of any

significant changes to any monitoring or mitigation program, including the reason for any such changes.

(vi) Compliance Report: A description of all instances of noncompliance with a site certificate condition. For ease of review, the certificate holder shall, in this section of the report, use numbered subparagraphs corresponding to the applicable sections of the site certificate.

(vii) Facility Modification Report: A summary of changes to the facility that the certificate holder has determined do not require a site certificate amendment in accordance with OAR 345-027-0050.

(viii) Nongenerating Facility Carbon Dioxide Emissions: For nongenerating facilities that emit carbon dioxide, a report of the annual fuel use by fuel type and annual hours of operation of the carbon dioxide emitting equipment as described in OAR 345-024-0630(4).

22 OAR 345-026-0105: The certificate holder and the Department of Energy shall exchange copies of all correspondence or summaries of correspondence related to compliance with statutes, rules and local ordinances on which the Council determined compliance, except for material withheld from public disclosure under state or federal law or under Council rules. The certificate holder may submit abstracts of reports in place of full reports; however, the certificate holder shall provide full copies of abstracted reports and any summarized correspondence at the request of the Department.

23 OAR 345-026-0170: The certificate holder shall notify the Department of Energy within 72 hours of any occurrence involving the facility if:

(a) There is an attempt by anyone to interfere with its safe operation;

(b) A natural event such as an earthquake, flood, tsunami or tornado, or a human-caused event such as a fire or explosion affects or threatens to affect the public health and safety or the environment; or

(c) There is any fatal injury at the facility.

V. SPECIFIC FACILITY CONDITIONS

The conditions listed in this section include conditions based on representations in the site certificate application and supporting record. These conditions are required under OAR 345-027-0020(10). The certificate holder must comply with these conditions in addition to the conditions listed in Section VI. This section includes other specific facility conditions the Council finds necessary to ensure compliance with the siting standards of OAR Chapter 345, Divisions 22 and 24, and to protect the public health and safety. For conditions that require subsequent review and approval of a future action, ORS 469.402 authorizes the Council to delegate the future review and approval to the Department if, in the Council's discretion, the delegation is warranted under the circumstances of the case.

1. Certificate Administration Conditions

24 The certificate holder shall begin construction of the facility by July 25, 2011. The Council may grant an extension of the deadline to begin construction in accordance with OAR 345-027-0030 or any successor rule in effect at the time the request for extension is submitted. [Amendment #1 (SFWF)]

25 The certificate holder shall complete construction of the facility by July 25, 2014. Construction is complete when: 1) the facility is substantially complete as defined by the

certificate holder's construction contract documents, 2) acceptance testing has been satisfactorily completed and 3) the energy facility is ready to begin continuous operation consistent with the site certificate. The certificate holder shall promptly notify the Department of the date of completion of construction. The Council may grant an extension of the deadline for completing construction in accordance with OAR 345-027-0030 or any successor rule in effect at the time the request for extension is submitted. [Amendment #1 (SFWF)]

26 The certificate holder shall construct a facility substantially as described in the site certificate and may select turbines of any type, subject to the following restrictions and compliance with all other site certificate conditions. Before beginning construction, the certificate holder shall provide to the Department a description of the turbine types selected for the facility demonstrating compliance with this condition.

(a) The total number of turbines at the facility must not exceed 116 turbines.

(b) The combined peak generating capacity of the facility must not exceed 290 megawatts.

(c) The turbine hub height must not exceed 105 meters and the maximum blade tip height must not exceed 150 meters.

(d) The minimum blade tip clearance must be ~~25~~ 21.5 meters above ground.

(e) The maximum volume of concrete above three feet below grade in the turbine foundations must not exceed 66 cubic yards.

(f) The maximum combined weight of metals in the tower (including ladders and platforms) and nacelle must not exceed 393 U.S. tons per turbine.

(g) The certificate holder shall request an amendment of the site certificate to increase the combined peak generating capacity of the facility beyond 290 megawatts, to increase the number of wind turbines to more than 116 wind turbines or to install wind turbines with a hub height greater than 105 meters, a blade tip height greater than 150 meters or a blade tip clearance less than 25 meters above ground.

[Amendment #1 (SFWF); Amendment #1]

27 The certificate holder shall obtain all necessary federal, state and local permits or approvals required for construction, operation and retirement of the facility or ensure that its contractors obtain the necessary federal, state and local permits or approvals.

28 Before beginning construction, the certificate holder shall notify the Department in advance of any work on the site that does not meet the definition of "construction" in ORS 469.300, excluding surveying, exploration or other activities to define or characterize the site, and shall provide to the Department a description of the work and evidence that its value is less than $250,000.

29 Before beginning construction and after considering all micrositing factors, the certificate holder shall provide to the Department, to the Oregon Department of Fish and Wildlife (ODFW) and to the Planning Directors of Morrow County and Gilliam County detailed maps of the facility site, showing the final locations where the certificate holder proposes to build facility components, and a table showing the acres of temporary and permanent habitat impact by habitat category and subtype, similar to Table 11 in the Final Order on Amendment #1 for the Shepherds Flat Wind Farm. The detailed maps of the facility site shall indicate the habitat categories of all areas that would be affected during construction (similar to the maps labeled "ODFW-2" in the site certificate application for the Shepherds

Flat Wind Farm). In classifying the affected habitat into habitat categories, the certificate holder shall consult with the ODFW. The certificate holder shall not begin ground disturbance in an affected area until the habitat assessment has been approved by the Department. The Department may employ a qualified contractor to confirm the habitat assessment by on-site inspection. [Amendment #1 (SFWF)]

30 Before beginning construction, the certificate holder shall submit to the State of Oregon through the Council a bond or letter of credit in the amount described herein naming the State of Oregon, acting by and through the Council, as beneficiary or payee. The initial bond or letter of credit amount is either $9.108 million (1st Quarter 2010 dollars), to be adjusted to the date of issuance as described in (b), or the amount determined as described in (a). The certificate holder shall adjust the amount of the bond or letter of credit on an annual basis thereafter as described in (b).

(a) The certificate holder may adjust the amount of the bond or letter of credit based on the final design configuration of the facility and turbine types selected by applying the unit costs and general costs illustrated in Table 3 in the Final Order on Amendment #1 for the Shepherds Flat Wind Farm and calculating the financial assurance amount as described in that order, adjusted to the date of issuance as described in (b) and subject to approval by the Department.

(b) The certificate holder shall adjust the amount of the bond or letter of credit, using the following calculation and subject to approval by the Department:

(i) Adjust the Subtotal component of the bond or letter of credit amount (expressed in 3rd Quarter 2009 dollars) to present value, using the U.S. Gross Domestic Product Implicit Price Deflator, Chain-Weight, as published in the Oregon Department of Administrative Services' "Oregon Economic and Revenue Forecast" or by any successor agency (the "Index") and using the index value for 3rd Quarter 2009 dollars and the quarterly index value for the date of issuance of the new bond or letter of credit. If at any time the Index is no longer published, the Council shall select a comparable calculation to adjust 3rd Quarter 2009 dollars to present value.

(ii) Add 1 percent of the adjusted Subtotal (i) for the adjusted performance bond amount to determine the adjusted Gross Cost.

(iii) Add 10 percent of the adjusted Gross Cost (ii) for the adjusted administration and project management costs and 10 percent of the adjusted Gross Cost (ii) for the adjusted future developments contingency.

(iv) Add the adjusted Gross Cost (ii) to the sum of the percentages (iii) and round the resulting total to the nearest $1,000 to determine the adjusted financial assurance amount.

(c) The certificate holder shall use a form of bond or letter of credit approved by the Council.

(d) The certificate holder shall use an issuer of the bond or letter of credit approved by the Council.

(e) The certificate holder shall describe the status of the bond or letter of credit in the annual report submitted to the Council under Condition 21.

(f) The bond or letter of credit shall not be subject to revocation or reduction before retirement of the facility site.

[Amendment #1 (SFWF); Amendment #1]

31 If the certificate holder elects to use a bond to meet the requirements of Condition 30, the certificate holder shall ensure that the surety is obligated to comply with the requirements of applicable statutes, Council rules and this site certificate when the surety exercises any legal or contractual right it may have to assume construction, operation or retirement of the energy facility. The certificate holder shall also ensure that the surety is obligated to notify the Council that it is exercising such rights and to obtain any Council approvals required by applicable statutes, Council rules and this site certificate before the surety commences any activity to complete construction, operate or retire the energy facility.

32 Before beginning construction, the certificate holder shall notify the Department of the identity and qualifications of the major design, engineering and construction contractor(s) for the facility. The certificate holder shall select contractors that have substantial experience in the design, engineering and construction of similar facilities. The certificate holder shall report to the Department any change of major contractors.

33 The certificate holder shall contractually require all construction contractors and subcontractors involved in the construction of the facility to comply with all applicable laws and regulations and with the terms and conditions of the site certificate. Such contractual provisions shall not operate to relieve the certificate holder of responsibility under the site certificate.

34 During construction, the certificate holder shall have a full-time, on-site assistant construction manager who is qualified in environmental compliance to ensure compliance with all site certificate conditions. The certificate holder shall notify the Department of the name, telephone number and e-mail address of this person.

35 Within 72 hours after discovery of conditions or circumstances that may violate the terms or conditions of the site certificate, the certificate holder shall report the conditions or circumstances to the Department.

2. Land Use Conditions

36 The certificate holder shall consult with area landowners and lessees during construction and operation of the facility and shall implement measures to reduce or avoid any adverse impacts to farm practices on surrounding lands and to avoid any increase in farming costs.

37 The certificate holder shall design and construct the facility using the minimum land area necessary for safe construction and operation. The certificate holder shall locate access roads and temporary construction laydown and staging areas to minimize disturbance with farming practices and, wherever feasible, shall place turbines and transmission interconnection lines along the margins of cultivated areas to reduce the potential for conflict with farm operations.

38 During construction and operation of the facility, the certificate holder shall implement a plan to control the introduction and spread of noxious weeds. The certificate shall develop the weed control plan consistent with the Gilliam County and Morrow County Weed Control Programs.

39 Before beginning construction of the facility, the certificate holder shall record in the real property records of Gilliam County a Covenant Not to Sue with regard to generally

accepted farming practices on adjacent farmland consistent with Gilliam County Zoning Ordinance 7.020(T)(4)(a)(5).

40 The certificate holder shall construct all facility components in compliance with the following setback requirements:

(a) All facility components must be at least 3,520 feet from the property line of properties zoned residential use or designated in the Gilliam County Comprehensive Plan as residential.

(b) Where (a) does not apply, the certificate holder shall maintain a minimum distance of 110-percent of maximum blade tip height, measured from the centerline of the turbine tower to the nearest edge of any public road right-of-way. The certificate holder shall assume a minimum right-of-way width of 60 feet.

(c) Where (a) does not apply, the certificate holder shall maintain a minimum distance of 1,320 feet, measured from the centerline of the turbine tower to the center of the nearest residence existing at the time of tower construction.

(d) Where (a) does not apply, the certificate holder shall maintain a minimum distance of 110-percent of maximum blade tip height, measured from the centerline of the turbine tower to the nearest boundary of the certificate holder's lease area.

41 Within 90 days after beginning operation, the certificate holder shall provide to the Department and to the Planning Directors of Gilliam County and Morrow County the actual latitude and longitude location or Stateplane NAD 83(91) coordinates of each turbine tower, connecting lines and transmission lines. In addition, the certificate holder shall provide to the Department and to the Planning Directors of Gilliam County and Morrow County, a summary of as-built changes in the facility compared to the original plan, if any.

42 The certificate holder shall install gates on all private facility access roads in Gilliam County, in accordance with Gilliam County Zoning Ordinance Section 7.020(T)(4)(d)(6).

3. Cultural Resource Conditions

43 Before beginning construction, the certificate holder shall provide to the Department a map showing the final design locations of all components of the facility and areas that would be temporarily disturbed during construction. In addition, the certificate holder shall comply with the following requirements:

(a) The certificate holder shall avoid disturbance within a 30-meter buffer around the historic-period archaeological sites within the facility boundary identified by AINW as "possibly eligible" for listing in the National Register of Historic Places (NRHP) as described in the Final Order on the Application for the Shepherds Flat Wind Farm.

(b) The certificate holder shall avoid disturbance of the stacked rock features within the facility boundary identified by AINW as "possibly eligible" for listing in the NRHP as described in the Final Order on the Application for the Shepherds Flat Wind Farm and shall, to the extent practicable, maintain a 30-meter no-construction buffer around these features. If a 30-meter buffer cannot be maintained, the certificate holder shall consult with the State Historic Preservation Office (SHPO) and the Department to determine appropriate action to preserve or document the feature.

(c) The certificate holder shall label "no entry" areas around all identified historic, cultural or archaeological resource sites on construction maps and drawings, and if

construction activities will occur within 200 feet of an identified site, the certificate holder shall flag a 30-meter buffer around the site.

(d) The certificate holder shall hire qualified personnel to conduct pre-construction field investigation for historic, cultural or archaeological resources in any areas of potential construction disturbance that AINW did not previously survey.

(e) The certificate holder shall provide written reports of the field investigation required under (d) to the Department and to the SHPO. If any historic, cultural or archaeological resources are found that the SHPO determines to be significant, the certificate holder shall consult with the Department and the SHPO to develop plan to avoid disturbance of the resources during construction and operation of the facility. The certificate holder shall instruct all construction personnel to avoid areas where the resources were found and shall implement other appropriate measures to protect the resources.

[Amendment #1 (SFWF)]

44 The certificate holder shall ensure that a qualified archeologist, as defined in OAR 736-051-0070, instructs construction personnel in the identification of cultural materials and avoidance of accidental damage to identified resource sites.

45 The certificate holder shall ensure that construction personnel cease all ground-disturbing activities in the immediate area if any archaeological or cultural resources are found during construction of the facility until a qualified archeologist can evaluate the significance of the find. The certificate holder shall notify the Department and the State Historic Preservation Office (SHPO) of the find. If the SHPO determines that the resource is significant, the certificate holder shall make recommendations to the Council for mitigation, including avoidance, field documentation and data recovery, in consultation with the Department, SHPO, interested tribes and other appropriate parties. The certificate holder shall not restart work in the affected area until the certificate holder has demonstrated to the Department and the SHPO that it has complied with archaeological resource protection regulations.

46 In reference to the presumed alignments of the Oregon Trail described in the Final Order on the Application, 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 to those remnants.

(b) The certificate holder shall not locate facility components on undeveloped land where the trail alignment was marked by existing Oregon-California Trail Association markers as described in the October 2007 Archaeological Investigations Northwest, Inc. report (No. 2012) on the Oregon Trail.

(c) Before beginning construction, the certificate holder shall provide to the State Historic Preservation Office (SHPO) and to 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.

4. Geotechnical Conditions

47 Before beginning construction, the certificate holder shall conduct a site-specific geotechnical investigation and shall report its findings to the Oregon Department of Geology & Mineral Industries (DOGAMI) and the Department. The certificate holder shall conduct the geotechnical investigation after consultation with DOGAMI and in general accordance with DOGAMI open file report 00-04 "Guidelines for Engineering Geologic Reports and Site-Specific Seismic Hazard Reports."

48 The certificate holder shall design and construct the facility in accordance with requirements set forth by the State of Oregon's Building Code Division and any other applicable codes and design procedures. The certificate holder shall design facility structures to meet or exceed the minimum standards required by the 2003 International Building Code.

49 The certificate holder shall design, engineer and construct the facility to avoid dangers to human safety presented by non-seismic hazards. As used in this condition, "non-seismic hazards" include settlement, landslides, flooding and erosion.

5. Hazardous Materials, Fire Protection & Public Safety Conditions

50 The certificate holder shall handle hazardous materials used on the site in a manner that protects public health, safety and the environment and shall comply with all applicable local, state and federal environmental laws and regulations. The certificate holder shall not store diesel fuel or gasoline on the facility site.

51 If a spill or release of hazardous material occurs during construction or operation of the facility, the certificate holder shall notify the Department within 72 hours and shall clean up the spill or release and dispose of any contaminated soil or other materials according to applicable regulations. The certificate holder shall make sure that spill kits containing items such as absorbent pads are located on equipment and at the field workshop. The certificate holder shall instruct employees about proper handling, storage and cleanup of hazardous materials. [Amendment #1 (SFWF)]

52 During construction, the certificate holder shall ensure that construction personnel are trained in fire prevention and response, that construction vehicles and equipment are operated on graveled areas to the extent possible and that open flames, such as cutting torches, are kept away from dry grass areas.

53 During operation, the certificate holder shall ensure that all on-site employees receive annual fire prevention and response training, including tower rescue training, by qualified instructors or members of the local fire districts. The certificate holder shall ensure that all employees are instructed to keep vehicles on roads and off dry grassland, except when off-road operation is required for emergency purposes. The certificate holder shall encourage employees to become volunteer members of local fire departments and shall facilitate appropriate training.

54 During construction and operation of the facility, the certificate holder shall ensure that the field workshop and all service vehicles are equipped with shovels and portable fire extinguishers of a 4A5OBC or equivalent rating. [Amendment #1 (SFWF)]

55 During construction and operation of the facility, the certificate holder shall develop and implement fire safety plans in consultation with the local fire protection agencies (the North Gilliam County Rural Fire Protection District and the Ione Rural Fire Protection District) 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, the certificate holder shall take into account the dry nature of the region and shall address risks on a seasonal basis. The certificate holder shall meet annually with local fire protection agency personnel to discuss emergency planning and shall invite local fire protection agency personnel to observe any emergency drill or tower rescue training conducted at the facility.

56 Upon the beginning of operation of the facility, the certificate holder shall provide a site plan to the local fire protection agencies (the North Gilliam County Rural Fire Protection District and the Ione Rural Fire Protection District). The certificate holder shall indicate on the site plan the identification number assigned to each turbine and the location of all facility structures and shall provide an updated site plan if additional turbines or other structures are later added to the facility. During operation, the certificate holder shall ensure that appropriate fire protection agency personnel have an up-to-date list of 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.

57 Before beginning construction, the certificate holder shall submit a Notice of Proposed Construction or Alteration to the Federal Aviation Administration (FAA) and the Oregon Department of Aviation identifying the proposed final locations of turbine towers and meteorological towers. The certificate holder shall promptly notify the Department of the responses from the FAA and the Oregon Department of Aviation. [Amendment #1 (SFWF)]

58 The certificate holder shall construct turbines on concrete foundations and shall surround the base of each tower with a ten-foot pad area of washed crushed rock on all sides. The certificate holder shall cover turbine pad areas with non-erosive, non-flammable material as soon as possible following exposure during construction and shall maintain the pad area covering during operation of the facility.

59 The certificate holder shall follow manufacturers' recommended handling instructions and procedures to prevent damage to turbine or turbine tower components that could lead to failure.

60 The certificate holder shall install and maintain self-monitoring devices on each turbine, connected to a fault annunciation panel or supervisory control and data acquisition (SCADA) system at the field workshop to alert operators to potentially dangerous conditions. The certificate holder shall maintain automatic equipment protection features in each turbine that would shut down the turbine and reduce the chance of a mechanical problem causing a fire. [Amendment #1 (SFWF)]

61 The certificate holder shall construct turbine towers with no exterior ladders or access to the turbine blades and shall install locked tower access doors. The certificate holder shall keep tower access doors locked at all times except when authorized personnel are present.

62 The certificate holder shall have an operational safety-monitoring program and shall inspect all turbine and turbine tower components on a regular basis. The certificate holder shall

maintain or repair turbine and turbine tower components as necessary to protect public safety.

63 For turbine types having pad-mounted step-up transformers, the certificate holder shall install the transformers at the base of each tower in locked cabinets designed to protect the public from electrical hazards and to avoid creation of artificial habitat for raptor prey.

64 To protect the public from electrical hazards, the certificate holder shall enclose the facility substation with appropriate fencing and locked gates. [Amendment #1 (SFWF)]

65 The certificate holder shall construct access roads with a finished width of approximately 16 feet, a compacted base of native soil and a gravel surface to a depth of four to ten inches. [Amendment #1 (SFWF); Amendment #1]

66 During construction, the certificate holder shall implement measures to reduce traffic impacts, including:

(a) Providing notice to the City of Arlington Road Department, the Gilliam County Road Department and the Gilliam County Sheriff's Office in advance of deliveries that could cause traffic disruption in Arlington.

(b) Providing notice to the residents of Arlington in advance of deliveries that could cause traffic disruption.

(c) Requiring flaggers to be at appropriate locations at appropriate times during construction to direct traffic.

67 The certificate holder shall cooperate with the Gilliam County Road Department and the Morrow County Public Works Department 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 pre-construction condition or better, to the satisfaction of the applicable county departments. If required by Morrow County or Gilliam County, the certificate holder shall post bonds to ensure funds are available to repair and maintain roads affected by the proposed facility.

68 During construction, the certificate holder shall require that all on-site construction contractors develop and implement a site health and safety plan that informs workers and others on-site what to do in case of an emergency and that includes the locations of fire extinguishers and nearby hospitals, important telephone numbers and first aid techniques. The certificate holder shall ensure that construction contractors have personnel on-site who are trained and equipped for tower rescue and who are first aid and CPR certified.

69 During operation, the certificate holder shall develop and implement a site health and safety plan that informs employees and others on-site what to do in case of an emergency and that includes the locations of fire extinguishers and nearby hospitals, important telephone numbers and first aid techniques.

70 During construction and operation of the facility, the certificate holder shall provide for on-site security and shall establish good communications between on-site security personnel and local law enforcement agencies (Gilliam County Sheriff and Morrow County Sheriff). During operation, the certificate holder shall ensure that appropriate law enforcement agency personnel have an up-to-date list of 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.

71 The certificate holder shall notify the Department and the Planning Directors of Gilliam County and Morrow County within 72 hours of any accidents including mechanical failures on the site associated with construction or operation of the facility that may result in public health and safety concerns.

6. Water, Soils, Streams & Wetlands Conditions

72 The certificate holder shall not build any roads or construct transmission line support poles within Eightmile Creek or within a 10-foot buffer from the ordinary high water line of the creek.

73 The certificate holder shall conduct all construction work in compliance with an Erosion and Sediment Control Plan (ESCP) satisfactory to the Oregon Department of Environmental Quality and as required under the National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge General Permit #1200-C. The certificate holder shall include in the ESCP any procedures necessary to meet local erosion and sediment control requirements or storm water management requirements.

74 During construction, the certificate holder shall limit truck traffic to designated existing and improved road surfaces to avoid soil compaction, to the extent practicable.

75 During construction, the certificate holder shall implement best management practices to control any dust generated by construction activities, such as applying water to roads and disturbed soil areas.

76 During construction, the certificate holder shall reduce temporary disturbance impacts by making use of previously disturbed areas, including roadways and tracks, and by preserving vegetation rootstalks by crushing, rather than scraping, vegetation in areas of temporary disturbance.

77 During facility operation, the certificate holder shall routinely inspect and maintain all roads, pads and trenched areas and, as necessary, maintain or repair erosion and sediment control measures. The certificate holder shall restore areas that are temporarily disturbed during facility maintenance or repair activities to pre-disturbance condition or better.

78 During facility operation, the certificate holder shall obtain water for on-site uses from a well at the field workshop, subject to compliance with applicable permit requirements. The certificate holder shall not use more than 5,000 gallons of water per day from the facility's on-site well. [Amendment #1 (SFWF)]

7. Transmission Line & EMF Conditions

79 The certificate holder shall install the 34.5-kV collector system underground to the extent practicable. The certificate holder shall install underground lines at a minimum depth of three feet. Based on geotechnical conditions or other engineering considerations, the certificate holder may install segments of the collector system aboveground on single-pole, cross-arm structures, but the total length of aboveground double-circuit segments installed on single-pole structures must not exceed 3.2 miles. [Amendment #1 (SFWF); Amendment #1]

80 The certificate holder shall ground appropriate sections of fencing that parallel transmission lines to reduce the risk of shock from induced voltage. In particular, the certificate holder shall ground appropriate sections of fencing located in the northern project area on the west side of Eightmile Canyon if the certificate holder builds a parallel transmission line in that location that could induce a voltage on the fence.

81 The certificate holder shall take reasonable steps to reduce or manage human exposure to electromagnetic fields, including but not limited to:

(a) Constructing all aboveground transmission lines at least 200 feet from any residence or other occupied structure, measured from the centerline of the transmission line.

(b) Constructing all aboveground 34.5-kV transmission lines with a minimum clearance of 20 feet from the ground.

(c) Constructing all aboveground 230-kV transmission lines with a minimum clearance of 24 feet from the ground.

(d) Fencing the areas near the facility substation to ensure that substation equipment is not accessible to the public.

(e) Providing to landowners a map of underground and overhead transmission lines on their property and advising landowners of possible health risks.

(f) Designing and maintaining all transmission lines so that alternating current electric fields do not exceed 9 kV per meter at one meter above the ground surface in areas accessible to the public.

[Amendment #1 (SFWF)]

82 In advance of, and during, preparation of detailed design drawings and specifications for 230-kV and 34.5-kV transmission lines, the certificate holder shall consult with the Utility Safety and Reliability Section of the Oregon Public Utility Commission to ensure that the designs and specifications are consistent with applicable codes and standards.

8. Plants, Wildlife & Habitat Protection Conditions

83 The certificate holder shall conduct wildlife monitoring as described in the *Wildlife Monitoring and Mitigation Plan* that is incorporated in the *Final Order on Amendment #1* as Attachment A and as amended from time to time. [Amendment #1 (SFWF); Amendment #1]

84 The certificate holder shall restore areas disturbed by facility construction but not occupied by permanent facility structures according to the methods and monitoring procedures described in the *Revegetation Plan* that is incorporated in the *Final Order on Amendment #1 for the Shepherds Flat Wind Farm* as Attachment SFS-B and as amended from time to time. [Amendment #1 (SFWF)]

85 The certificate holder shall acquire the legal right to create, enhance, maintain and protect a habitat mitigation area as long as the site certificate is in effect by means of an outright purchase, conservation easement or similar conveyance and shall provide a copy of the documentation to the Department. Within the habitat mitigation area, the certificate holder shall improve the habitat quality as described in the *Habitat Mitigation Plan* that is incorporated in the *Final Order on Amendment #1* as Attachment C and as amended from time to time. [Amendment #1 (SFWF); Amendment #1]

86 The certificate holder shall avoid permanent and temporary disturbance to the areas described in (a) through (g) and, during the times indicated, shall avoid construction

disturbance in the areas described in (h) through (k). The certificate holder shall flag these areas for the duration of construction activities nearby and shall ensure that construction personnel avoid disturbance of the areas. The avoidance areas are:

(a) All Category 1 and those areas of Category 2 habitat shown on the "ODFW-2" Figures 1 through 12 in the Shepherds Flat Wind Farm Application. [Amendment #1 (SFWF)]

(b) Eight small areas of Category 3 shrub-steppe habitat as described in the Final Order on Amendment #1 for the Shepherds Flat Wind Farm, Section IV.4.(b)A. [Amendment #1 (SFWF)]

(c) All seeps, riparian areas and vernal pools.

(d) All water sources for wildlife, including perennial and intermittent streams, stock ponds and watering stations.

(e) All faces of bluffs or rock outcroppings.

(f) All trees or other structures that contain active raptor nests.

(g) For the facility substation and field workshop, all Category 3 habitat. [Amendment #1 (SFWF)]

(h) [Text was removed by Amendment #1]

(i) The area within 0.5 miles of Category 3 curlew nesting habitat and the area within 0.5 miles the BLM Horn Butte Wildlife Area 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 may engage in construction activities in these areas at times other than the nesting season.

(j) The area within 1,000 feet of any essential, limited and irreplaceable Washington ground squirrel (WGS) habitat within the new areas added to the site by Amendment #1 (excluding the areas within the site boundaries of Shepherds Flat North, Shepherds Flat Central and Shepherds Flat South as approved on September 11, 2009) during the period in which the squirrels are active. The certificate holder shall hire a qualified independent professional biologist to conduct pre-construction surveys for State-listed threatened, endangered or sensitive wildlife species in these new areas within 1,000 feet of any area potentially disturbed by facility construction. To determine whether WGS habitat exists and to determine whether WGS are active, the biologist shall search for WGS in suitable habitat using a two-survey protocol approved by the Oregon Department of Fish and Wildlife (ODFW). The certificate holder shall submit the results of the survey to ODFW and to the Department. If signs of WGS activity are observed, the certificate holder shall flag the avoidance area and ensure that construction personnel avoid disturbance of the area until the biologist has determined that the WGS are no longer active.

(k) Areas within a suitable buffer around confirmed populations of Laurent's milk-vetch or any other State-listed threatened or endangered plant species within the new areas added to the site by Amendment #1 (excluding the area within the site boundaries of Shepherds Flat North, Shepherds Flat Central and Shepherds Flat South as approved on September 11, 2009). The certificate holder shall not install facility components or cause temporary disturbance within these areas. The certificate holder shall hire a qualified independent professional biologist to conduct pre-construction surveys for State-listed threatened or endangered plant species in these new areas within 1,000 feet of any area potentially disturbed by facility construction. The certificate holder shall submit the results of the survey to the Department.

[Amendment #1]

87 The certificate holder shall microsite the facility in conformance with the industry's best practices. The certificate holder shall follow the recommendations of a qualified wildlife biologist to avoid building turbine towers in the following locations:

(a) Areas of increased risk to avian species due to constricted flight paths, such as narrow ridge saddles and gaps between hilltops.

(b) Areas on slopes greater than 20 percent.

(c) [text removed by Amendment #1 (SFWF)]

(d) [text removed by Amendment #1 (SFWF)]

88 During construction, the certificate holder shall avoid construction activities in areas around active nests of the following species during the sensitive period, as provided in this condition:

Species	Sensitive Period	Early Release Date
Swainson's hawk	April 1 to August 15	May 31
Ferruginous hawk	March 15 to August 15	May 31
Burrowing owl	April 1 to August 15	July 15

The certificate holder shall conduct pre-construction surveys, using a protocol approved by the Oregon Department of Fish and Wildlife (ODFW) to determine whether there are any active nests of these species within 0.5 miles of any areas that would be disturbed during construction. The certificate holder shall search the scheduled construction areas and all areas within 0.5 miles of the construction areas. If a nest is occupied by any of these species after the beginning of the sensitive period, the certificate holder will flag the boundaries of a 0.5-mile buffer area around the nest and shall instruct construction personnel to avoid disturbance of the area. The certificate holder shall hire a qualified independent professional biologist to observe the active nest sites during the sensitive period for signs of disturbance and to notify the Department of any non-compliance with this condition. If the biologist observes nest site abandonment or other adverse impact to nesting activity, the certificate holder shall implement appropriate mitigation, in consultation with ODFW and subject to the approval of the Department, unless the adverse impact is clearly shown to have a cause other than construction activity. The certificate holder may begin or resume construction activities within a buffer area before the ending day of the sensitive period if any known nest site is not occupied by the early release date. If a nest site is occupied, then the certificate holder may begin or resume construction before the ending day of the sensitive period with the approval of ODFW, after the young are fledged. The certificate holder shall use a protocol approved by ODFW to determine when the young are fledged (the young are independent of the core nest site).

89 The certificate holder shall not remove any trees that are greater than three feet in height.

90 The certificate holder shall design all aboveground transmission line support structures following the most current suggested practices for avian protection on power lines published by the Avian Power Line Interaction Committee.

91 The certificate holder shall reduce the risk of injuries to avian species by:

(a) Installing turbine towers that are smooth steel structures that lack features that would allow avian perching.

(b) Installing meteorological towers that are non-guyed structures to eliminate the risk of avian collision with guy-wires.

(c) Avoiding installation of aboveground transmission lines across narrow saddles, ravines and similar features and, where such crossings cannot be avoided, installing line-markers to make the lines more visible to avian species.

92 The certificate holder shall impose and enforce construction and operation speed limits of 5 miles per hour on roads within 1,000 feet of Category 1 or Category 2 WGS habitat and 20 miles per hour on all other facility roads and shall ensure that all construction and operations personnel are instructed on the importance of cautious driving practices while on facility roads. [Amendment #1]

9. Visual Effects Conditions

93 To reduce the visual impact of the facility, the certificate holder shall:

(a) Mount nacelles on smooth, steel structures, painted uniformly in a matte-finish, neutral white color.

(b) Paint substation structures in a neutral color to blend with the surrounding landscape.

(c) Not allow any advertising to be used on any part of the facility.

(d) Use only those signs required for facility safety, required by law or otherwise required by this site certificate, except that the certificate holder may erect a sign to identify the facility near the field workshop, may paint turbine numbers on each tower and may allow unobtrusive manufacturers' logos on turbine nacelles.

(e) Not locate any facility signs along Highway 74.

(f) Design signs in accordance with Gilliam County Zoning Ordinance Section 8.030 and Morrow County Zoning Ordinance Section 4.070, as applicable.

(g) Maintain any signs allowed under this condition in good repair.

[Amendment #1 (SFWF)]

94 The certificate holder shall design and construct the field workshop to be generally consistent with the character of similar buildings used by commercial farmers or ranchers in the area and shall paint the building in a neutral color to blend with the surrounding landscape. [Amendment #1 (SFWF)]

95 The certificate holder shall not use exterior nighttime lighting except:

(a) The minimum turbine tower lighting required or recommended by the Federal Aviation Administration.

(b) Security lighting at the field workshop and substation, provided that such lighting is shielded or downward-directed to reduce glare.

(c) Minimum lighting necessary for repairs or emergencies.

(d) Minimum lighting necessary for nighttime construction. The certificate holder may use lighting only 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 shall not be directed outward. The certificate holder shall use nighttime lighting only with the approval of the owner of the property on which the work is conducted and shall provide notice of nighttime construction to occupants of all residences within one-half mile of the construction site.

[Amendment #1 (SFWF)]

10. Noise Control Conditions

96 To reduce noise impacts at nearby residences, the certificate holder shall:
(a) Confine the noisiest operation of heavy construction equipment to the daylight hours.
(b) Require contractors to install and maintain exhaust mufflers on all combustion engine-powered equipment; and
(c) Establish a complaint response system at the construction manager's office to address noise complaints.

97 Before beginning construction, the certificate holder shall provide to the Department:
(a) Information that identifies the final design locations of all turbines to be built at the facility.
(b) The maximum sound power level for the substation transformers and the maximum sound power level and octave band data for the turbines selected for the facility based on manufacturers' warranties or confirmed by other means acceptable to the Department.
(c) The results of noise analysis of the facility to be built according to the final design performed in a manner consistent with the requirements of OAR 340-035-0035 (1)(b)(B)(iii)(IV) and (VI) demonstrating to the satisfaction of the Department that the total noise generated by the facility (including the noise from turbines and substation transformers) would meet the ambient degradation test and maximum allowable test at the appropriate measurement point for all potentially-affected noise sensitive properties.
(d) For each noise-sensitive property where the certificate holder relies on a noise waiver to demonstrate compliance in accordance with OAR 340-035-0035 (1)(b)(B)(iii)(III), a copy of the a legally effective easement or real covenant pursuant to which the owner of the property authorizes the certificate holder's operation of the facility to increase ambient statistical noise levels L_{10} and L_{50} by more than 10 dBA at the appropriate measurement point. The legally-effective easement or real covenant must: include a legal description of the burdened property (the noise sensitive property); be recorded in the real property records of the county; expressly benefit the certificate holder; expressly run with the land and bind all future owners, lessees or holders of any interest in the burdened property; and not be subject to revocation without the certificate holder's written approval.

98 During operation, the certificate holder shall maintain a complaint response system to address noise complaints. The certificate holder shall promptly notify the Department of any complaints received regarding facility noise and of any actions taken by the certificate holder to address those complaints. In response to a complaint from the owner of a noise sensitive property regarding noise levels during operation of the facility, the Council may require the certificate holder to monitor and record the statistical noise levels to verify that the certificate holder is operating the facility in compliance with the noise control regulations. [Amendment #1 (SFWF)]

11. Waste Management Conditions

99 The certificate holder shall provide portable toilets for on-site sewage handling during construction and shall ensure that they are pumped and cleaned regularly by a licensed contractor who is qualified to pump and clean portable toilet facilities.

100 During operation, the certificate holder shall discharge sanitary wastewater generated at the field workshop to a licensed on-site septic system in compliance with county permit

requirements. The certificate holder shall design the septic system for a discharge capacity of less than 2,500 gallons per day. [Amendment #1 (SFWF)]

101 The certificate holder shall implement a waste management plan during construction that includes but is not limited to the following measures:

(a) Recycling steel and other metal scrap.

(b) Recycling wood waste.

(c) Recycling packaging wastes such as paper and cardboard.

(d) Collecting non-recyclable waste for transport to a local landfill by a licensed waste hauler or by using facility equipment and personnel to haul the waste.

(e) Segregating all hazardous wastes such as used oil, oily rags and oil-absorbent materials, mercury-containing lights and lead-acid and nickel-cadmium batteries for disposal by a licensed firm specializing in the proper recycling or disposal of hazardous wastes.

(f) Discharging all concrete truck rinse water into foundation holes and completing truck wash-down off-site.

102 The certificate holder shall implement a waste management plan during operation that includes but is not limited to the following measures:

(a) Training employees to minimize and recycle solid waste.

(b) Recycling paper products, metals, glass and plastics.

(c) Recycling used oil and hydraulic fluid.

(d) Collecting non-recyclable waste for transport to a local landfill by a licensed waste hauler or by using facility equipment and personnel to haul the waste.

(e) Segregating all hazardous, non-recyclable wastes such as used oil, oily rags and oil-absorbent materials, mercury-containing lights and lead-acid and nickel-cadmium batteries for disposal by a licensed firm specializing in the proper recycling or disposal of hazardous wastes.

103 Before beginning construction, the certificate holder shall determine whether any construction disturbance would occur in locations not previously investigated for potential jurisdictional waters as described in the *Final Order on Amendment #1*. The certificate holder shall conduct pre-construction investigations in these new areas within 1,000 feet of any area potentially disturbed by facility construction to determine whether any State-jurisdictional waters exist in those locations. The certificate holder shall submit a written report on the pre-construction investigation to the Department of Energy and to the Department of State Lands for approval before beginning construction and shall ensure that construction would have no impact on any jurisdictional water identified in the report. [Amendment #1]

VI. SUCCESSORS AND ASSIGNS

To transfer this site certificate or any portion thereof or to assign or dispose of it in any other manner, directly or indirectly, the certificate holder shall comply with OAR 345-027-0100.

VII. SEVERABILITY AND CONSTRUCTION

If any provision of this agreement and certificate is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and conditions shall not be affected,

and the rights and obligations of the parties shall be construed and enforced as if the agreement and certificate did not contain the particular provision held to be invalid.

VIII. GOVERNING LAW AND FORUM

This site certificate shall be governed by the laws of the State of Oregon. Any litigation or arbitration arising out of this agreement shall be conducted in an appropriate forum in Oregon.

IX. EXECUTION AND EFFECTIVE DATE

This site certificate may be executed in counterparts and will become effective upon signature by the Chair of the Energy Facility Siting Council and the authorized representative of the certificate holder. [Amendment #1 (SFWF); Amendment #1]

IN WITNESS WHEREOF, this site certificate has been executed by the State of Oregon, acting by and through its Energy Facility Siting Council, and by Horseshoe Bend Wind, LLC.

ENERGY FACILITY SITING COUNCIL	HORSESHOE BEND WIND, LLC
By: _____	By: _____
Robert Shiprack, Chair Oregon Energy Facility Siting Council	Derrel A. Grant, Vice-President Horseshoe Bend Wind, LLC
Date: March 12, 2010	Date: March 12, 2010

Attachment 2. DOGAMI Consultation Notes

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Shepherd's Flat Central RFA 2 for Two Demo Turbines

Consultation with Oregon Department of Geology and Mineral Industries (DOGAMI) DRAFT Summary

Portland, OR (Skype call-in)

August 20, 2019

Attendees

- **DOGAMI** – Yumei Wang, P.E. (via phone)
- **Oregon Department of Energy** – Christopher Clark (via phone)
- **Caithness Energy** – Vandana (Vann) Gupta, John Wanalista, P.E. (via phone)
- **Tetra Tech** – Carrie Konkol, Suzy Cavanagh, P.G. (via phone)

Meeting Purpose

This meeting was intended to satisfy OAR 345-021-0010(1)(h)(B) that requires pre-application consultation with DOGAMI for energy facilities. Accordingly, DOGAMI requested that notes be taken for review and comment by ODOE and DOGAMI and then included into the Request for Amendment to identify consultation.

Project Description:

- Caithness Energy has three operating wind farms in Oregon; Shepherd's Flat North, Shepherd's Flat Central, and Shepherd's Flat South. This Request for Amendment (RFA) 2 is to repower two turbines in Shepherd's Flat Central. The two "demo" turbines will be upgraded to current technology by modifying the turbine nacelles and exchanging existing blades for longer turbine blades on existing turbine towers.
- The plan is to repower these two turbines in the fall of this year during typical operation and maintenance activities. This is the first of four amendments to repower the remaining Shepherd's Flat turbines in each project area (north, central, and south).

Dialogue:

- RFA 2 will be submitted to ODOE early next week.
- The original application for site certificate (ASC) and Exhibit H were submitted in 2007. In the 2007 Exhibit H, Table 2 lists two faults (Arlington Shutler Butte fault and Columbia Hills structure) that have an epicentral distance of approximately 6 km away from the project area. The 2007 Exhibit H, Section 7 discusses design spectrum period which used 2006 IBC, Figure 8 shows a map of the faults that are referred to, and Figure 6 gives the response spectra. Those two faults have much higher spectral accelerations than if only IBC is looked at.

- The 2007 Exhibit H indicates that seismic does govern at this project area. DOGAMI requests that this is addressed in the report.
- DOGAMI requests that with any modification to the existing turbines, long period ground motions are looked at.
- Coming up this year in October, it is expected that the Oregon Structural Specialty Code will likely be updated to the current IBC and ASCE 7-16. DOGAMI suggests that Caithness consider running the forthcoming code on this in each of the forthcoming RFAs. Given the timing of this RFA 2, it may not be needed because it might be submitted prior to the update.
- Discussion on the weight of the blades. Caithness received load tables based on loads when the turbine operates from GE. The updated load tables were analyzed based on the existing foundations in the bearing capacity study. The bearing capacity study report includes an overturning analysis and sliding check, etc.
- DOGAMI requested that these consultation notes be attached to the RFA and to be sure that any reports are consistent with the Oregon requirements.
- This RFA 2 is following the Type B process and the format does not include an Exhibit H, but the applicant will respond to the structural standard within the RFA. The prior site-specific geotechnical studies were included in the 2007 submittal prior to construction and will not be conducted for this RFA.
- DOGAMI requested that current code and the future code, addressing long series ground motion with those two specific faults (Arlington Shutler Butte fault and Columbia Hills structure) be addressed. Look at it from a deterministic basis, not just a probabilistic basis. Yumei will flag a few pages of the previous Exhibit H and email out to the group.
- DOGAMI requested that disaster resilience and future climate change are addressed in the document.
- The timeline is to get the notes to DOGAMI this week for review. The RFA and bearing capacity study will be sent to DOGAMI via ODOE next week.

Action Items

- Tetra Tech will prepare draft consultation meeting notes and email to DOGAMI for review within this week.
- DOGAMI to send out relevant pages of the 2007 ASC Exhibit H in regards to faults and seismic information to consider.
- Caithness will verify seismic design information in the bearing capacity study, as well as the pending Oregon Structural Specialty Code updates, prior to submittal.
- Caithness/TT to send DOGAMI (cc ODOE) bearing capacity study for review, possibly prior to RFA 2 being delivered to ODOE.

Additional Notes

- After the consultation call, Caithness looked at seismic parameters for both ASCE 7-10 and ASCE 7-16 using coordinates for turbines T-368 and T-370. The ASCE 7-16 analysis show the seismic coefficients decrease slightly from ASCE 7-10. This information will be included in RFA2.

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Attachment 3. Seismic Ground Factors

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Search Information

Coordinates: 45.5828, -120.067

Elevation: ft

Timestamp: 2019-09-12T18:57:41.430Z

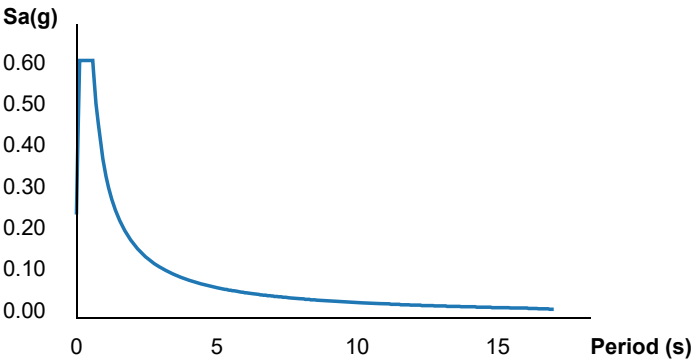
Hazard Type: Seismic

Reference Document: ASCE7-10

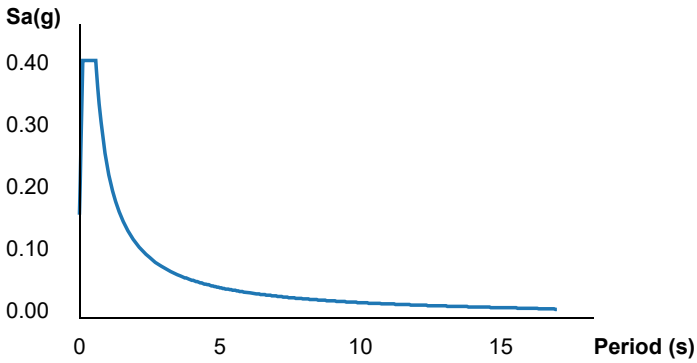
Risk Category: II

Site Class: D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.426	MCE_R ground motion (period=0.2s)
S_1	0.171	MCE_R ground motion (period=1.0s)
S_{MS}	0.622	Site-modified spectral acceleration value
S_{M1}	0.362	Site-modified spectral acceleration value
S_{DS}	0.415	Numeric seismic design value at 0.2s SA
S_{D1}	0.242	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	D	Seismic design category
F_a	1.459	Site amplification factor at 0.2s
F_v	2.114	Site amplification factor at 1.0s
CR_S	0.916	Coefficient of risk (0.2s)
CR_1	0.895	Coefficient of risk (1.0s)
PGA	0.179	MCE_G peak ground acceleration
F_{PGA}	1.441	Site amplification factor at PGA

Search Information

Coordinates: 45.5828, -120.067

Elevation: ft

Timestamp: 2019-09-12T18:57:16.422Z

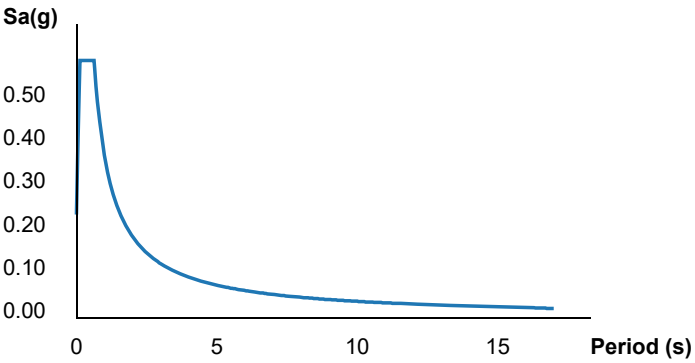
Hazard Type: Seismic

Reference Document: ASCE7-16

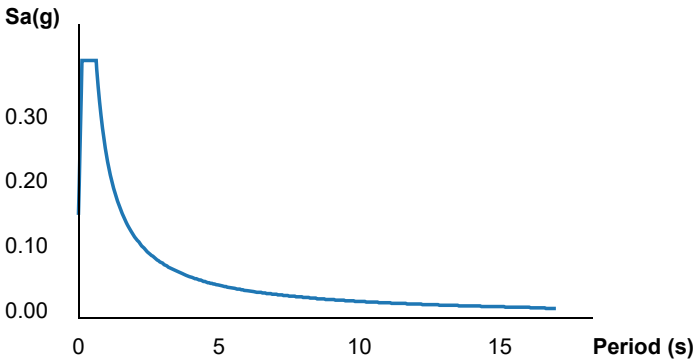
Risk Category: II

Site Class: D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.405	MCE_R ground motion (period=0.2s)
S_1	0.166	MCE_R ground motion (period=1.0s)
S_{MS}	0.597	Site-modified spectral acceleration value
S_{M1}	0.376	Site-modified spectral acceleration value
S_{DS}	0.398	Numeric seismic design value at 0.2s SA
S_{D1}	0.251	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	D	Seismic design category
F_a	1.476	Site amplification factor at 0.2s
F_v	2.269	Site amplification factor at 1.0s
CR_S	0.905	Coefficient of risk (0.2s)
CR_1	0.886	Coefficient of risk (1.0s)
PGA	0.181	MCE_G peak ground acceleration
F_{PGA}	1.437	Site amplification factor at PGA

Search Information

Coordinates: 45.5657, -119.951

Elevation: ft

Timestamp: 2019-09-12T18:58:43.626Z

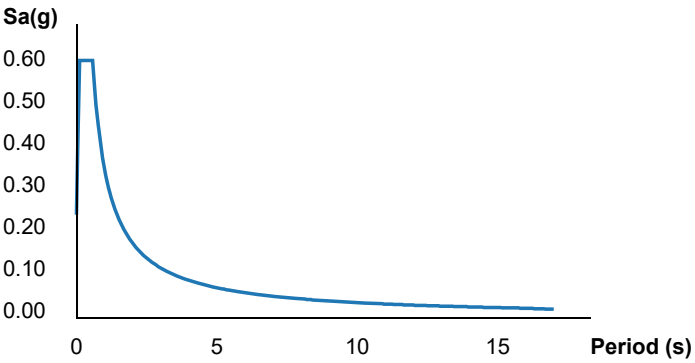
Hazard Type: Seismic

Reference Document: ASCE7-10

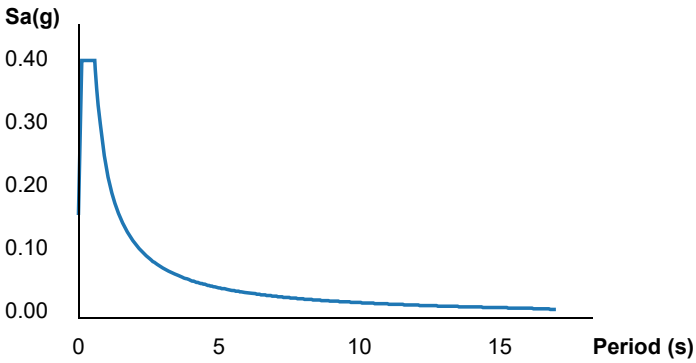
Risk Category: II

Site Class: D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.418	MCE_R ground motion (period=0.2s)
S_1	0.166	MCE_R ground motion (period=1.0s)
S_{MS}	0.613	Site-modified spectral acceleration value
S_{M1}	0.355	Site-modified spectral acceleration value
S_{DS}	0.409	Numeric seismic design value at 0.2s SA
S_{D1}	0.237	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	D	Seismic design category
F_a	1.465	Site amplification factor at 0.2s
F_v	2.134	Site amplification factor at 1.0s
CR_S	0.915	Coefficient of risk (0.2s)
CR_1	0.892	Coefficient of risk (1.0s)
PGA	0.176	MCE_G peak ground acceleration
F_{PGA}	1.447	Site amplification factor at PGA

Search Information

Coordinates: 45.5657, -119.951

Elevation: ft

Timestamp: 2019-09-12T18:59:12.116Z

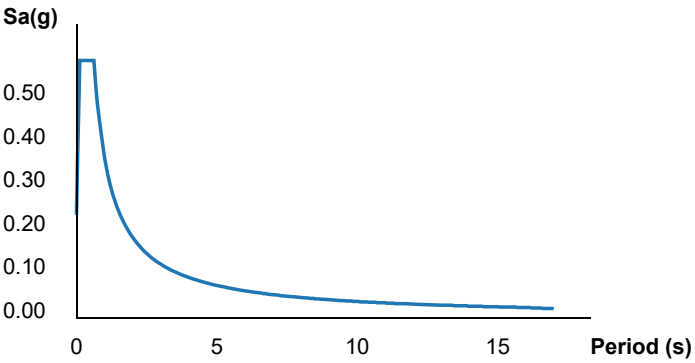
Hazard Type: Seismic

Reference Document: ASCE7-16

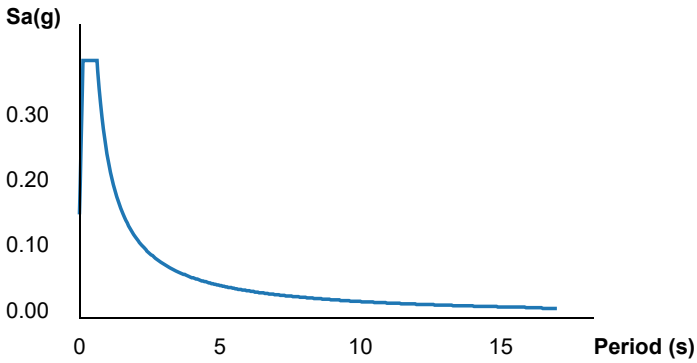
Risk Category: II

Site Class: D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.399	MCE_R ground motion (period=0.2s)
S_1	0.162	MCE_R ground motion (period=1.0s)
S_{MS}	0.591	Site-modified spectral acceleration value
S_{M1}	0.369	Site-modified spectral acceleration value
S_{DS}	0.394	Numeric seismic design value at 0.2s SA
S_{D1}	0.246	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	D	Seismic design category
F_a	1.481	Site amplification factor at 0.2s
F_v	2.276	Site amplification factor at 1.0s
CR_S	0.906	Coefficient of risk (0.2s)
CR_1	0.888	Coefficient of risk (1.0s)
PGA	0.179	MCE_G peak ground acceleration
F_{PGA}	1.442	Site amplification factor at PGA

Attachment 4. Emergency Action Plan

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Revision 14

Element 11-B

Emergency Preparedness and Fire Prevention

Prepared by: K. Magallaness

Approved by: Brian Walencik

Released by: NAM Onshore Wind Program Review Board

Revision History

Revision No.	Date	Description of Change	Revised by
1	9/24/2007	Additional documents required for the Wind Field Operations group.	D. Olson
2	1/30/2008	Added cold weather policy.	D. Olson
3	2/28/2008	Updated Attachment 11, sections 4.5 to 4.9	D. Olson
4	5/16/2008	Updated Attachment 13, all of section 4.2.	D. Olson
5	9/2/2008	Updated definition of Attachment 12, 3.3, Safe Location and 4.5.	D. Olson
6	8/14/2009	Updated Attachment 3.3.1 of Attachment 11 from 5 minutes to 30 minutes.	D. Olson
7	9/4/2009	Added Attachment 14- EMS Coordination	A. Bitar M. Winward
8	11/5/2010	Updated Attachment 13 – clarify and improve guidance on icing	E. LaRiviere D. Schultz D. Olson L. Barlow D. Parker T. Brown S. O'Connor
9	1/7/2013	Updated language for 2.x turbines (focus on MVSG)	J. Bollenbecker
10	6/8/2013	Addition of Attachment 15 Hot Weather Work	S. Herranz
11	08/25/2017	Updated format and business Clarification to Attachment 11, Section 3.0 DTN Notification	J. Hock
12	08/21/2018	Added items 3.1.4 and 3.1.5 to Attachment 11 Modified wording on item 3.1.2 on Attachment 11	K. Magallanes
13	11/19/2018	Modified wording on item 3.1. to 3.6 on Attachment 11 to match with climbing rules	K. Magallanes
14	03/22/2019	Modified wording on item 3.1. & 3.5 on Attachment 11 to match with new terminology of the lightning monitoring system.	S. Lapointe

1.0 Purpose and Scope

1.1 The purpose of this document is to provide additional guidance to the site in establishing an Emergency Preparedness Plan for the Wind Field Operations group (WFO). This addition to the Emergency Preparedness and Fire Prevention procedure is specific to the needs of the WFO group.

1.2 The addition includes activities at the service center as well as work carried out on the Projects and Services site. Contents of the additional guidance document are as follows:

1.2.1 Attachment (11) - Lightning/High Winds
1.2.2 Attachment (12) - Icing on Blades or External Equipment
1.2.3 Attachment (13) – Cold Weather Work
1.2.4 Attachment (14) – EMS Coordination

2.0 Auditing

2.1 This addition will be reviewed annually by completing the CEP Health and Safety Framework Element 11 "Emergency Preparedness" and updating the procedure accordingly.

ATTACHMENT 11

Lightning / High Winds

1.0 Weather forecasts and observations

1.1 Forecasts must be consulted at the beginning of each work shift or the day before in order to prepare for any inclement weather.

1.2 No work shall be scheduled in the WTG towers if thunderstorms, lightning, rain, hail, or snow is in the near-term forecasts. Scope and duration of work shall be scheduled consistent with the forecast for the day.

1.3 All WTG maintenance work in the towers must be postponed until the weather clears up.

2.0 Working in WTG Towers during Storms

2.1 As weather conditions develop and are favorable for the formation of thunderstorms, use extreme caution when working in the field paying special attention to the developing weather conditions.

2.2 Site personnel should understand when, where, and how thunderstorms develop. If there is thunder heard in an approaching cloud, all work up-tower work will be stopped and all personnel will climb down and seek shelter.

2.3 It is everyone's responsibility to make sure that all personnel are notified of lightening in the area.

2.4 Contact the Site Leader or designee to inform them of lightning sightings.

- 2.4.1 The Site Leader then notifies all personnel in the field that lightning is in the area.
- 2.4.2 If employee cannot get ahold of the Area / Site Manager, then it becomes the responsibility of the person who had the sighting to notify all affected employees.

2.5 EVERY crew must respond by radio or other communications, acknowledging they have received the warning.

2.6 The Site Leader will decide if the employees should return to the service/project office or wait in service trucks for the storm to pass.

2.7 All work on tall, conductive structures will be stopped (this will include and is not limited to HV transmission lines, SCADA infrastructure, MET towers, or WTGs).

2.8 Adequate shelter may include service trucks. This acts as a faraday cage to protect against lightning strikes.

3.0 Lightning Limitations:

3.1 Digital detection tools (GE approved Severe Weather Alert & Monitoring System) will be implemented at site.

3.2 Level 1 (L1) Alert is defined as confirmed lightning between 48 and 80 km (30-50 miles) from where work is being performed. During a Level 1 Alert, all personnel are to be made aware of the lightning in the area and should be prepared to stop work and seek shelter as the storm moves closer. Direction and wind speed of the storm will be monitored at the office.

3.3 Level 2 (L2) Alert is defined as confirmed lightning detected less than 48 km (30 miles) from where work is being performed. During a Level 2 Alert all personnel are to stop work immediately and seek shelter at least 300 ft. away from the tower pad.

3.4 All Clear is given when no lightning strikes have been observed within a 30-mile radius from where work is being performed for a period greater than 30 minutes.

3.5 MET Towers: Both Level 1 (confirmed lightning between 48 and 80 km (30-50 miles)) and Level 2 Alerts (defined as confirmed Lightning less than 48 km (30 miles)) from the center-point of the site monitoring area where work is being performed, all personnel are to stop work immediately and seek for shelter at least 300 ft. away from the tower pad.

Teams cannot return to field work activities until all (L1 & L2) All Clear notifications have been issued. All Clear notification is set up in the GE approved Severe Weather Alert & Monitoring System as an alert to indicate there have been no lightning strikes observed within a 30-mile or 50-mile radius for a period greater than 30 minutes.

3.6 Civil and Excavation Work without cranes involved: Begin to seek shelter if lightning strike has been identified within 15 miles radius from where work is being performed. All Clear is given when no lightning strikes have been observed within a 15-mile radius from where work is being performed for a period greater than 30 minutes.

Note: Acceptable shelters are O&M buildings or fully enclosed structures, properly installed construction office trailers, "Fully enclosed" metal roofed vehicles or equipment with ROPS (with the windows up.

4.0 Working WTG Towers During High Winds

4.1 High wind speed is normally associated with thunderstorms. Wind may increase rapidly with little to no advanced warning. Use caution and be aware of debris that can and will be moved by the high wind.

4.2 Use care when seeking shelter in a service truck. High winds can severely damage doors.

4.3 Stay away from glass whenever possible. Sheer winds in a storm can blow trucks over. If winds get severe enough, pull over to a safe location and point truck into wind.

4.4 It is the responsibility of all employees to report severe wind changes out in the field i.e. severe directional change or severe increase in wind speed.

4.5 At an average wind speed (10-minute average) of less than 15 m/s (33 mph), there are no wind speed related restrictions on work at the WTG.

4.6 At an average wind speed (10-minute average) of 15m/s to 19 m/s (33 mph – 44 mph):

4.6.1 Climbing on lattice towers is prohibited.

4.6.2 Climbing WTG's equipped with internal ladders will be permitted; however, no work shall be performed outside of the nacelle or transfers into the hub.

4.7 At an average wind speed (10-minute average) of 20 m/s (45 mph) or greater:

4.7.1 Climbing all WTG's is prohibited.

4.8 At wind speeds at or greater than 25m/s (60mph), no personnel are permitted to be out on the wind site. This restriction does not apply to office, service, or shop areas.

4.9 Exceptions to the above limits must be authorized by the site supervisor and site EHS after a risk assessment is performed.

ATTACHMENT 12

Icing on Blade or External Equipment

1.0 Purpose

1.1 This procedure is designed to mitigate the risks associated with working on or near WTG's during conditions favorable to icing on blades and external WTG surfaces.

2.0 Overview

2.1 Under no condition will any WTG be approached by motor vehicle or accessed while ice is shedding from exterior surface of the WTG.

2.2 Site personnel will assess the risk of falling ice before planning work.

3.0 Definitions

3.1 Ice/Icing: Formation of frozen water on the surface of the WTG

3.2 WTG: Wind Turbine Generator.

3.3 Safe Location: Distance from the WTG equal to the product of 1.5 x (hub height + the rotor diameter). Note: for the 1.5 MW wind turbine, this distance can be conservatively assumed to be 300 meters if the calculation has not been done for a particular site.

3.4 SCADA: Supervisory Control and Diagnostic Analysis.

3.5 Shedding: Ice that is falling off or breaking away.

4.0 Assessing Icing on Blades or External Equipment

4.1 Weather forecasts must be consulted at the beginning of each work shift and discussed during pre- work / tailboard meetings. Weather should also be monitored through the day in order to prepare for any inclement weather.

4.2 In cold conditions in which the weather is favorable for ice forming, an initial inspection from a safe location shall be performed before any work begins on the WTG. Conditions that promote or indicate icing or ice shedding include:

- 4.2.1 Below normal production for current wind speed/ irregular patterns in production
- 4.2.2 Visible ice or snow on the turbine
- 4.2.3 Signs of fallen ice around the turbine or in the surrounding area
- 4.2.4 Temperatures around the freezing point
- 4.2.5 Freezing rain within the last 24 hours
- 4.2.6 Gusty or strong winds
- 4.2.7 Strong or direct sunlight

4.3 If ice is observed shedding in the area, personnel should not attempt to enter the WTG. Personnel should remain in a safe location and contact site management immediately.

5.0 Approaching Wind Turbines

5.1 The turbine shall be stopped remotely and nacelle shall be yawed to the desired location via SCADA. Preferably, the blades should be aligned opposite the entry door.

5.2 Once all motion has stopped, personnel should wait several minutes to ensure no ice is shedding before approaching the turbine.

5.3 At least one crewmember must be designated to watch for shedding ice while maintaining radio communication with the rest of the team. Binoculars or a spotting scope should be used to help identify ice on blades, nacelle or hub. If ice is observed, personnel should notify site management immediately before proceeding.

5.4 Approach the WTG with extreme care and park the service vehicle 60 feet away from the turbine. When parking vehicle attempt to minimize the need for personnel to walk through deep snow or ice. To avoid walking and handling materials through deep snow/ice, the vehicle may need to be parked closer than the normal distance from the WTG.

5.5 Approach the WTG from behind the hub to decrease risk of being hit if ice falls from the hub.

5.6 No work shall be performed on top of the WTG, including any transitions to the hub, wind vane, or FAA lights if there is ice present on the walking surfaces.

5.7 All WTG work in or on the towers must be postponed until the ice has shed and/or there is no danger of ice shedding.

5.8 If personnel are inside of a WTG when shedding begins, exiting from the tower is prohibited until the shedding has ceased.

ATTACHMENT 13

Cold Weather Work

1.0 Purpose

1.1 This procedure is designed to mitigate the risk(s) associated with working on or near WTG's during cold weather conditions.

2.0 Overview

2.1 Limits will be placed on various work activities when ambient temperature(s) exceed those identified in this procedure. Limits may also be put in place as wind speeds increase potential exposure to personnel (wind chill).

3.0 Definitions

3.1 WTG: - Wind Turbine Generator.

3.2 Ambient temperature: - The temperature of the air surrounding, inside or outside of an object, in this case a WTG. This does NOT include a Wind Chill Factor.

3.3 Wind Chill Factor: - The apparent temperature which describes the cooling effect on exposed skin by the combination of temperature and wind, expressed as the loss of body heat. Increased wind speed will accelerate the loss of body heat.

3.4 Frostbite: - The partial freezing of exposed parts of the body, causing injury to the skin and sometimes to deeper tissues. Often afflicts the nose, ears or other extremities of the body.

3.5 Hypothermia: - The condition of having an extremely low body temperature, often as a result of exposure to cold water or frigid atmospheric conditions. Normal body functions become impaired and the condition can eventually become fatal.

3.6 PPE: - Personal Protective Equipment

3.7 FR: - Flame Resistant (NFPA 70E)

4.0 Cold Weather Work and Restrictions

4.1 Work should be completed in the warmest part of the day when possible. Review local weather forecasts and try to adjust schedule accordingly.

4.2 The following restrictions will be followed for short-term extreme cold weather work. These restrictions are also represented in Figures 1 and 2, as indicated.

4.2.1 At or below –12.2° C (10° F) site EHS representatives and site leadership will evaluate the work scope and any appropriate strategies to mitigate the effects of the temperature extreme.

4.2.2 Between –12.2° C (10° F) and –23.3° C (-10° F), entries to the hub will be restricted to the temperature and wind speed combinations indicated by the "white zone" depicted in Figure 1.

4.2.3 At or below –23.3° C (-10° F) hub entries will be halted due to potential for cold weather injury.

4.2.4 At or below –32° C (-24° F) all inside, up tower work will cease and all other work will follow the requirements of Figure 2.

4.2.4.1 Requirements of Figure 2 must allow for an appropriate area for breaks or rest. Appropriate areas should be dry and allow for the body to warm up above ambient temperature.

4.2.5 No deviations to these limits will be allowed without a review being completed to discuss work scope, protective measures, PPE and immediate need. For Wind Field Services and Projects, this review must be completed with the Regional EHS Leader, Service Area Manager, Site Operations Leader and Site EHS Coordinator. The EHS Regional Leader and Service Area Manager must approve the request prior to any work being conducted. For Wind Global Field Operations, this review must be completed with the Regional EHS Leader, Pole Field Operations Manager, Project Manager, Site Manager and Site EHS Manager. The Regional EHS Manager and the Pole Field Operations Manager must approve the request prior to any work being conducted.

4.2.5.1 <u>For 2.x turbines only</u>: During prolonged cold soak events where the grid remains de-energized and external ambient temperature is below -30 ^{0}C, the medium voltage switchgear will be disconnected from the grid automatically. Upon grid re-energization, the internal turbine air surrounding the MVSG must warm up above –25 ^{0}C prior to entering the turbine to reclose the MVSG. Additionally, use of the load disconnect switch panel of the switchgear must not be attempted until ambient air surrounding MVSG temperature is above – 25 ^{0}C.

4.3 Personal Protective Equipment (PPE) must meet the necessary requirements to protect the worker from the potential of arc flash associated with work around exposed energy sources.

4.3.1 Outerwear must be composed of natural fiber with an appropriate weight or have an FR rating appropriate for the energy exposed to.

4.3.2 Innerwear, which is in contact with the employees' skin, must also be composed of natural fiber or have an FR rating.

4.4 Heaters are authorized in principle to modify ambient temperature conditions in the tower and in the nacelle. However, any heater used and its installation must be approved by the Regional EHS Leader and, if wiring is involved, the Engineering department. Heaters involving combustible liquids or gasses are discouraged and if approved will be operated in conjunction with a Hot Work Permit. JSA/RSA's will be created for all instances where a heater is to be used.

5.0 Training

5.1 Personnel should recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.

5.1.1 Review of Figure 1 and Figure 2 should be completed.

5.2 Personnel should review the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.

5.3 At a minimum, once per season all site personnel with receive a tailboard talk on the danger of cold weather, signs of hypothermia, and the strategies to mitigate the effects of cold such as proper clothing, vehicle maintenance, the buddy system, access to break areas, and limiting exposure time.

5.4 Field service personnel will be assigned the Extreme Temperatures course in myLearning.

Figure 1

In General:

From 10 F to –15 F, site leadership take prudent countermeasures. Begin limiting hub entry based on wind speed at 10 F.

At –10 F and below, hub entry not allow

At –15 F and below, follow ACGIH chart for rest intervals and for work stoppage unless emergency.

At –22 F, the WTG stops operating, no rpm testing possible.

At –24 F, all uptower work ceases.

At –44 F and below, all work on the wind farm ceases

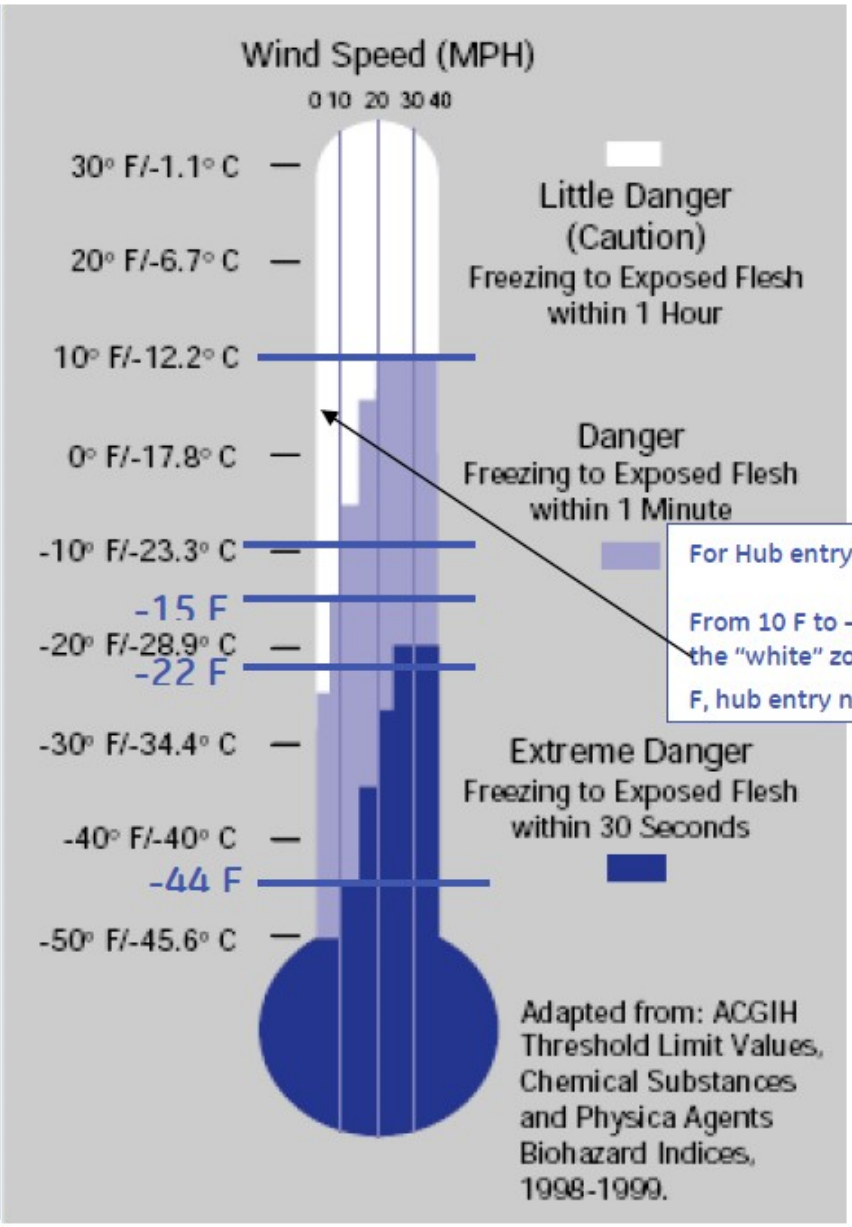

Figure 2

Inside up tower working window.

THRESHOLD LIMIT VALUES WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT*

Air Temperature Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx)	°F (approx)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26° to -28°	-15° to -19°	(Norm breaks) 1		(Norm breaks) 1		75 min.	2	55 min.	3	40 min.	4
-29° to -31°	-20° to -24°	(Norm breaks) 1		75 min.	2	55 min.	3	40 min.	4	30 min.	5
-32° to -34°	-25° to -29°	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease	
-35° to -37°	-30° to -34°	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease			
-38° to -39°	-35° to -39°	40 min.	4	30 min.	5	Non-emergency work should cease					
-40° to -42°	-40° to -44°	30 min.	5	Non-emergency work should cease							
-43° to below	-45° & below	Non-emergency work should cease									

- At –22 F (-30 C) the WTG will not operate.

ATTACHMENT 14

EMS Coordination

1.0 Purpose

1.1 Facilitate effective coordination between the Wind Projects and Services site and the local emergency response organizations.

2.0 Overview

2.1 Site is required to share information and emergency plans with Local EMS and foster effective coordination in the event of an emergency.

3.0 Definitions

3.1 Local EMS – Local Emergency Medical Service (i.e. Fire Department)

4.0 EMS Coordination

4.1 Each Wind Projects and Services Sites shall establish a relationship with local EMS responders, including
- 4.1.1 Orientation to the layout of the site
  - 4.1.1.1 Site turbine access roads.
  - 4.1.1.2 If access roads are gated, gated with locks, or electrical gates: identify muster point and responsible person that will meet and escort local EMS through gates to reach scene of emergency.
  - 4.1.1.3 Ensure responsible person has key/codes to proceed through locked gates.
- 4.1.2 Hazards inherent to wind sites
- 4.1.3 Emergency plans
- 4.1.4 Emergency response capabilities of site personnel
- 4.1.5 Support required of local EMS
- 4.1.6 Each site will determine and communicate in advance the process of supporting EMS access to site and navigation to the location of an emergency

4.2 Local EMS will be invited to tour the site

4.3 Each site will coordinate one emergency drill per calendar year with local EMS

4.4 Provide local EMS with emergency play and build rapport with local EMS and review applicable emergency scenarios (i.e. suspension trauma, electrical burns, etc.)

5.0 Training

5.1 All site personnel should review and understand site-specific emergency plan: responsible persons, roles, and contacts.

5.2 Site-specific emergency plan should be included in site orientation.

ATTACHMENT 15

Hot Weather Work

1.0 Purpose

1.1 This procedure is designed to mitigate the risk(s) associated with working on or near WTGs during hot weather conditions.

2.0 References

2.1 Element 15.1 Heat Illness Prevention Plan

2.2 Risk assessment of heat stroke by determining heart rate: http://libraries.ge.com/download?fileid=352315826101&entity_id=23877701101&sid=101

3.0 Overview

3.1 Limits will be placed on various work activities when ambient temperature(s) exceed those identified in this procedure. Limits may also be put in place as humidity increases the potential exposure to personnel.

4.0 Definitions

4.1 WTG: Wind Turbine Generator

4.2 Ambient temperature: The temperature of the air surrounding, inside, or outside of an object, in this case a WTG.

4.3 Nacelle temperature: The temperature displayed by the WTG nacelle thermometer

4.4 Heat stroke: a form of hyperthermia; an abnormally elevated body temperature with accompanying physical symptoms including changes in the nervous system function, heat stroke is a true medical emergency that is often fatal if not properly and promptly treated.

4.5 PPE: Personal Protective Equipment

5.0 Hot Weather Work and Restrictions

5.1 The level of risk will be determined by 3 variables: type of task, temperature, and humidity:

5.2 Type of tasks – categorize the type of work to be carried out:

5.2.1 Light work: testing, checks, oil changes
5.2.2 Moderate work: small corrective measures, changing of small components
5.2.3 Heavy work: climbing the WTG, major corrective measures, changing of rotor, generator, crown, and nacelle.

5.3 Temperature: value indicated by the thermometer installed inside the nacelle (T int)

5.4 Humidity: the estimation of the ambient relative humidity (weather forecast agency):

5.4.1 10% - 30% Low

5.4.2 30% - 50% Medium

5.4.3 50% - 70% High

5.5 Once the type of work is determined and the temperature and humidity are characterized, determine the possible existence of the risk of heat stroke, per the following classification:

Activity	Humidity	T int (ºC / °F) *
Light	Low	41 / 105.8
	Medium	39 / 102.2
	High	36 / 96.8
Moderate	Low	39 / 102.2
	Medium	36 / 96.8
	High	34 / 93.2
Heavy	Low	33 / 91.4
	Medium	30 / 86
	High	28 / 82.4

5.6 In those scenarios where "T int" variable is higher than the maximum included in the above table, site EHS representatives and site leadership will evaluate the work scope and any appropriate strategies to mitigate the effects of temperature extremes based on:

5.6.1 Planning of the work: postpone the work until another time of the workday where the environmental conditions are not so adverse (temperature and humidity not as high), preferably first thing in the morning.

5.6.2 In case the activity cannot be rescheduled due to its urgency, breaks should be scheduled to reduce potential risk. The following table shows the maximum exposure times to limit the temperature increase as per the calculation for predicted heat strain in an average individual.

Activity	T int (ºC / °F)	Time max (min)	Recovery time (min)
Light	36 – 41 / 96.8 – 105.8	30	5
Moderate	34 – 41 / 93.2 – 105.8	20	10
Heavy	28 – 41 / 82.4 – 105.8	15	15

5.6.3 No climbing (without climb assist / elevator) or heavy activity will be performed at "T int" of >42° C / 107.6° F

5.6.4 Only acclimatized employees are allowed to carry out activities under these circumstances.

5.6.4.1 Acclimatization programs will be established for new employees or employees who have been absent from work for a prolonged period. The acclimatization program can take between 7 and 14 days, so that each day the time gradually increases until reaching a full day of work.

5.7 No deviations to these limits will be allowed without a review being completed to discuss work scope, protective measures, PPE and immediate need. For Wind Field Services and Projects, this review must be completed with the Regional EHS Leader, Service Area Manager (or equivalent), Site Operations Leader and Site EHS Coordinator. The EHS Regional Leader and Service Area Manager (or equivalent) must approve the request prior to any work being conducted. For Wind Global Field Operations (Wind Projects), this review must be completed with the Regional EHS Leader, Pole Field Operations Manager, Project Manager, Site Manager, and Site EHS Manager. The Regional EHS Manager and Pole Field Operations Manager must approve the request prior to any work being conducted.

5.8 Hydration

5.8.1 Dehydration is the excessive loss of body water, producing different pathologies. It is important that workers maintain sufficient hydration at all times. This will generally be implemented through the following hydration protocol:

5.8.1.1 Intake of two (2) glasses of water before starting any work.

5.8.1.2 Continuous intake of water during the course of work (small amounts in the order of 100 to 150 mL (approx. a half cup) every 15-20 minutes).

5.8.2 The water supply should be fresh and cool. It may also be recommended to compensate for the loss of electrolytes and minerals by drinking electrolyte replacement drinks along with water. Certain medical conditions and medications can increase the risk of heat related illness, and can have an impact on recommended hydration strategies. Employees should consult their personal physician before initiating a personal hydration protocol.

5.9 Climbing Considerations

5.9.1 Do a minimum of warming-up physical exercise before climbing the WTG, to prepare the body for the activity.

5.9.2 Stop and rest every 9 meters (approx. 30 feet) (resting platform) for approximately 1 minute or more.

5.9.3 Employees will be allowed to wear light clothing (thinner layers, not flame retardant), if not exposed to open electrical cabinets or hot surfaces. See HS13.2C Electrical Service Bulletin for specific electrical uniform requirements.

6.0 Training

6.1 Personnel should recognize the environmental and workplace conditions that lead to potential heat-induced illnesses and injuries.

6.2 All employees reasonably expected to be potentially exposed to temperatures and humidity levels that reach or exceed Tint of 28°C or 82.4°F during work shall be trained on the risks and conditions that can lead to potential heat-induced illnesses and injuries.

6.3 Training includes:

6.3.1 Annually: Extreme Temperature Awareness initial / refresher courses (GE-GBL-315 and GE-GBL-315R).

6.3.2 Once per season minimum: All site personnel will participate in a tailboard discussion about this procedure and the dangers of working in hot weather. The discussion should include the following:

6.3.2.1 Signs and symptoms of heat-induced illnesses and injuries and what can be done to help the worker.
6.3.2.2 Signs of hypothermia and dehydration
6.3.2.3 Strategies to mitigate the effects of heat such as proper clothing, ventilation, access to break areas, and limiting exposure time.

7.0 Health Surveillance

7.1 Specific medical tests can be conducted for the early detection of sensitivity to heat exposure for employees based in hot weather areas.

7.2 Employees are encouraged to maintain their physical fitness, controlled body weight, healthy diet, etc.

Attachment 5. Public Service Provider Responses and Information

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From: Gulick, Kristen
To: Solsby, Anneke
Subject: FW: Shepherd"s Flat Wind Project - Continued Water Provider
Date: Thursday, November 7, 2019 4:24:57 PM

Here you go! See below for confirmation for the City of Arlington.

Thank you!

Kristen Gulick | **Environmental Planner**
Kristen.Gulick@tetratech.com

Part-time Schedule: Monday – Thursday, Fri as needed

Tetra Tech | **Portland**
1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
Direct: 503.721.7216 x 2241 | Fax: 503.227.1287 | Cell: 541.740.3316

From: Pam Rosenbalm <cityofa@gorge.net>
Sent: Thursday, November 7, 2019 4:24 PM
To: Gulick, Kristen <Kristen.Gulick@tetratech.com>
Subject: RE: Shepherd's Flat Wind Project - Continued Water Provider

The City of Arlington is able to provide the average water amount of 50,000 gallons per day. Thank you Pam Rosenbalm

---

From: Gulick, Kristen [mailto:Kristen.Gulick@tetratech.com]
Sent: Thursday, November 07, 2019 2:51 PM
To: Pam Rosenbalm <cityofa@gorge.net>
Subject: RE: Shepherd's Flat Wind Project - Continued Water Provider

Here is that info regarding the duration of the turbine upgrade!
Facility-wide repowering is projected to be completed on a rolling schedule, over an approximately 11-month time frame, with typically 5-10 turbines being powered at a time. Repower activities at each turbine will occur over the course of approximately 2 weeks.

Thank you!

Kristen Gulick | **Environmental Planner**

Kristen.Gulick@tetratech.com

Part-time Schedule: Monday – Thursday, Fri as needed

Tetra Tech | **Portland**
1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
Direct: 503.721.7216 x 2241 | Fax: 503.227.1287 | Cell: 541.740.3316

From: Gulick, Kristen
Sent: Thursday, November 7, 2019 2:44 PM
To: Pam Rosenbalm <cityofa@gorge.net>
Subject: FW: Shepherd's Flat Wind Project - Continued Water Provider
Importance: High

Hi Pam,
I have a follow up confirmation regarding the Shepherd's Flat Wind Farm and the City or Arlington's ability to continue to supply water for the project. See our previous email chain below where you confirmed that Arlington could supply the water as required.

I want to confirm that the City of Arlington can provide an average amount of 50,000 gallons per day for dust suppression and road compaction during construction.

I apologize for the short-notice, but we are needing a response by the end of the business day if possible.

Thank you in advance, I genuinely appreciate it!

Kristen Gulick | **Environmental Planner**
Kristen.Gulick@tetratech.com

Part-time Schedule: Monday – Thursday, Fri as needed

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1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
Direct: 503.721.7216 x 2241 | Fax: 503.227.1287 | Cell: 541.740.3316

From: Pam Rosenbalm <cityofa@gorge.net>
Sent: Thursday, August 29, 2019 2:54 PM
To: Gulick, Kristen <Kristen.Gulick@tetratech.com>
Subject: RE: Shepherd's Flat Wind Project - Continued Water Provider

The City of Arlington is able to provide water as required by the facility to upgrade their project. Water right permit number 93757. Thank you Pam Rosenbalm City Recorder

---

From: Gulick, Kristen [mailto:Kristen.Gulick@tetratech.com]
Sent: Thursday, August 29, 2019 9:55 AM
To: Pam Rosenbalm <cityofa@gorge.net>
Cc: esmoothz@yahoo.com; cbrodeo@gmail.com; Solsby, Anneke <Anneke.Solsby@tetratech.com>
Subject: RE: Shepherd's Flat Wind Project - Continued Water Provider
Importance: High

Hello,
Just wanted to check in on the status of the updated water supply letter. We are closing in on our deadline for responses. Please, let me know if you have any more questions and we are anticipating your reply!

Sincerely,
Kristen Gulick

From: Gulick, Kristen
Sent: Monday, August 19, 2019 10:19 AM
To: Pam Rosenbalm <cityofa@gorge.net>
Subject: RE: Shepherd's Flat Wind Project - Continued Water Provider

Hi Pam,
Although exact amounts of water are unknown at this time, I can tentatively say that yes, the developer does plan to purchase water from the City or Arlington. Arlington was the water supplier for the project before back when the project was first constructed and therefore they would like to remain with the same supplier. As stated before, at this point in the process, the project is not required to have entered into a contract with the City of Arlington, we just need to demonstrate to ODOE that we have been in consultation with the local water provider and that yes, you are able to provide water to the project, as well as any constraints you may have.

Hopefully that helps!
Thanks,

Kristen Gulick | **Environmental Planner**
Kristen.Gulick@tetratech.com

Part-time Schedule: Monday – Thursday, Fri as needed

Tetra Tech | Portland
1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
Direct: 503.721.7216 x 2241 | Fax: 503.227.1287 | Cell: 541.740.3316

From: Pam Rosenbalm <cityofa@gorge.net>
Sent: Monday, August 19, 2019 10:11 AM
To: Gulick, Kristen <Kristen.Gulick@tetratech.com>
Subject: RE: Shepherd's Flat Wind Project - Continued Water Provider

I have been asked to question if you will in fact be purchasing water from the City of Arlington.
Thanks Pam

From: Gulick, Kristen [mailto:Kristen.Gulick@tetratech.com]
Sent: Monday, August 19, 2019 9:41 AM
To: cityofa@gorge.net
Cc: esmoothz@yahoo.com; cbrodeo@gmail.com
Subject: Shepherd's Flat Wind Project - Continued Water Provider
Importance: High

Hello,
I am contacting you on behalf of the Shepherd's Flat Wind Project, which has been operational for a number of years in Morrow and Gilliam counties. The project is proposing a repowering, which entails replacing the existing turbine blades and associated machinery with longer blades and more advanced machinery to optimize energy output with upgraded equipment, thereby generating more electricity with no increase in the project's footprint. Here is a link for the for further project information.
https://www.oregon.gov/energy/facilities-safety/facilities/Pages/SFC.aspx

The City of Arlington previously provided confirmation in 2007 that they did not anticipate any adverse effects from the construction/operation of the wind farm and could provide up to 70 million gallons for construction (over 9 to 12 months) of the project. The repowering will require much less and as stated previously, construction is already complete and the project is currently operational. What we are hoping for at this point is an updated formal confirmation that the City of Arlington can still provide water as required by the facility as well as Arlington's water right permit number. This can be in the form of a statement on your letterhead with your signature if you like, or even a simple

reply to this email. See the attached letter as an example we received for another renewable energy project in Oregon.

Although I imagine you have drafted similar letters of support before, I wanted to provide more background for the facility just in case. Tetra Tech is under contract to Caithness Shepherds Flat, LLC through the Oregon Dept. of Energy's (ODOE) permitting process. To this end, we will provide to ODOE evidence of consultation with local municipalities that we have been in contact regarding water supply for the repowering of the facility. At this point in the process, the project is not required to have entered into a contract with the City of Arlington we just need to demonstrate to ODOE that we have been in consultation with local water providers and that yes, you are able to provide water to the project, as well as any constraints you may have. Any letter from you to me on this subject does not constitute a contract and you are under no obligation to supply water for the facility.

If you could please confirm that the above agreement is accurate as soon as you can, that would be greatly appreciated. This is a very quick project turn-around.

Thanks so much,

Kristen Gulick | **Environmental Planner**
Kristen.Gulick@tetratech.com

Part-time Schedule: Monday – Thursday, Fri as needed

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1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
Direct: 503.721.7216 x 2241 | Fax: 503.227.1287 | Cell: 541.740.3316

Gilliam County Sheriff's Office

Gary Bettencourt, Sheriff

PO Box 685, 221 S. Oregon Street, Condon, OR 97823

541-384-2851- Fax: 541-384-2878

August 20, 2019

Kristen Gulick
For Caithness Shepherds Flatt, LLC
Rhea Lane
Arlington, Oregon 97823

Dear Ms. Gulick

The Gilliam County Sheriff's Office is capable of handling any potential increase in calls for service without noticeable effect on our local needs for service during your repowering project.

I do request names and phone numbers of the site manager, project manager, safety manager and the lead on-site contractor.

Sincerely,

Sheriff Gary Bettencourt

From: Debbie Morgan
To: Gulick, Kristen
Subject: Re: Shepherd"s Flat Wind Project - Continued Fire Protection Support
Date: Monday, August 19, 2019 3:18:31 PM

Ione Rural Fire Protection District will continue to provide fire protection for the Shepherds Flat wind project.

Virgil Morgan
Fire Chief; Ione RFPD

Sent from my iPhone

On Aug 19, 2019, at 9:40 AM, Gulick, Kristen <Kristen.Gulick@tetratech.com> wrote:

> Hello,
> I am contacting you on behalf of the Shepherd's Flat Wind Project, which has been operational for a number of years in Morrow and Gilliam counties. The project is proposing a repowering, which entails replacing the existing turbine blades and associated machinery with longer blades and more advanced machinery to optimize energy output with upgraded equipment, thereby generating more electricity with no increase in the project's footprint. Here is a link for the for further project information. https://www.oregon.gov/energy/facilities-safety/facilities/Pages/SFC.aspx
>
> The Ione Rural Fire Protection District previously provided confirmation in 2007 that they did not anticipate any adverse effects from the construction/operation of the wind farm and can provide fire protection. What we are hoping for at this point is an updated formal confirmation that the Fire Protection District can still serve the project and have the ability to respond to incidents as required by the facility. This can be in the form of a statement on your letterhead with your signature if you like, or even a simple reply to this email.
>
> Although I imagine you have drafted similar letters of support before, I wanted to provide more background for the facility just in case.
> Tetra Tech is under contract to Caithness Shepherds Flat, LLC through the Oregon Dept. of Energy's (ODOE) permitting process. To this end, we will provide to ODOE evidence of consultation with local municipalities that we have been in contact regarding fire protection for the repowering of the facility. At this point in the process, the project is not required to have entered into a contract with the Ione Rural Fire Protection District, we just need to demonstrate to ODOE that we have been in consultation with fire protection districts and that yes, you are able to provide fire support to the project, as well as any constraints you may have. Any letter from you to me on this subject does not constitute a contract and you are under no obligation to supply fire protection for the facility.

If you could please confirm that the above agreement is accurate as soon as you can, that would be greatly appreciated. This is a very quick project turn-around.

Thanks so much,

Kristen Gulick | **Environmental Planner**
Kristen.Gulick@tetratech.com

Part-time Schedule: Monday – Thursday, Fri as needed

Tetra Tech | **Portland**
1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
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From: Melissa Ross
To: Gulick, Kristen
Subject: RE: Shepherd"s Flat Wind Project - Continued Police Support
Date: Tuesday, August 20, 2019 11:23:14 AM

Dear Ms. Gulick,
In response to your email dated 8-19-19, the Morrow County Sheriff's Office will respond to any emergency calls you may have in the area of Shepherd's Flat Wind Project.

Due to the fact your project is at the far end of our patrol areas with very few calls for service you may expect not to have regular police coverage.

I would anticipate with the nature of transporting large blades for replacement, maintenance etc., that on those occasions of such movements on narrow roads with multiple curves, etc., that I would request notification be made when such movements are planned.

Should you have additional questions, please contact me.

Kenneth W. Matlack, Sheriff
Morrow County Sheriff's Office
Office phone: 541-676-5317
Cell phone: 541-314-5201

(transmitted by m. ross)

From: Gulick, Kristen [mailto:Kristen.Gulick@tetratech.com]
Sent: Monday, August 19, 2019 9:39 AM
To: DL_Sheriffs Office <sheriff@co.morrow.or.us>
Cc: John Bowles <jbowles@co.morrow.or.us>; Melissa Ross <mross@co.morrow.or.us>
Subject: Shepherd's Flat Wind Project - Continued Police Support
Importance: High

Hello,
I am contacting you on behalf of the Shepherd's Flat Wind Project, which has been operational for a number of years in Morrow and Gilliam counties. The project is proposing a repowering, which entails replacing the existing turbine blades and associated machinery with longer blades and more advanced machinery to optimize energy output with upgraded equipment, thereby generating more electricity with no increase in the project's footprint. Here is a link for the for further project information.
https://www.oregon.gov/energy/facilities-safety/facilities/Pages/SFC.aspx

The Morrow County Sheriff previously provided correspondence that they can provide police protection with stipulations (see attached from 2007). These stipulations have been met at this point. What we are hoping for at this point is an updated formal confirmation that the Morrow County Sheriff can still serve the project and have the ability to respond to incidents as able for the facility. This can be in the form of a statement on your letterhead with your signature if you like, or even a simple reply to this email.

Although I imagine you have drafted similar letters of support before, I wanted to provide more background for the facility just in case. Tetra Tech is under contract to Caithness Shepherds Flat, LLC through the Oregon Dept. of Energy's (ODOE) permitting process. To this end, we will provide to ODOE evidence of consultation with local municipalities that we have been in contact regarding police protection for the repowering of the facility. At this point in the process, the project is not required to have entered into a contract with the Morrow County Sheriff, we just need to demonstrate to ODOE that we have been in consultation with police departments and that yes, you are able to provide police support to the project, as well as any constraints you may have. Any letter from you to me on this subject does not constitute a contract and you are under no obligation to supply police protection for the facility.

If you could please confirm that the above agreement is accurate as soon as you can, that would be greatly appreciated. This is a very quick project turn-around.

Thanks so much,

Kristen Gulick | **Environmental Planner**
Kristen.Gulick@tetratech.com

Part-time Schedule: Monday – Thursday, Fri as needed

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1750 SW Harbor Way, Suite 400 | Portland, OR 97201 | www.tetratech.com
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Gilliam County Fire Services
PO Box 83
Condon, OR 97823
(541) 454-2900 or (541) 384-5555

August 14, 2019

Dear Kristen:

North Gilliam County Rural Fire Protection District understands that the Caithness Shepherds Flat, LLC wind project, through contract with Tetra Tech, will be replacing the turbine blades with longer blades, and more advanced machinery, to optimize energy output of the existing wind turbines.

North Gilliam County RFPD is the primary fire protection provider for the Shepherds Flat Wind Project that is within Gilliam County. It is important to emphasize that we not provide either confined space or high angle rescue.

Sincerely,

Laci Olsen

Laci Olsen
Gilliam County Fire Services Coordinator

COLUMBIA RIDGE LANDFILL

18177 Cedar Springs Lane
Arlington, OR 97812

www.wmnorthwest.com/landfill

HOURS OF OPERATION

6:00 a.m. – 4:30 p.m.
Monday – Friday

Columbia Ridge Landfill & Green Energy Plant

Columbia Ridge provides safe and professional disposal services for communities, businesses and industries primarily from Oregon and Washington. Located in north central Oregon, the site provides convenient truck and rail access. In addition, the site's dry climate and unique geology support superior environmental performance, while the rural locale allows for a 10,000-acre buffer sustainably managed for agriculture and wildlife. Columbia Ridge is also a platform for wind power and green technologies that use waste to generate renewable energy.

Columbia Ridge is a modern Subtitle D landfill that accepts primarily municipal solid waste (MSW or household waste) as well as industrial and special wastes. It is engineered with overlapping environmental protection systems that meet or exceed rigorous state and federal regulations and are subject to highly regulated monitoring and reporting requirements.

Columbia Ridge uses sophisticated monitoring protocols to verify that its environmental protection systems are operating properly. Monitoring data gathered by company and independent professionals is submitted to the Oregon Department of Environmental Quality (DEQ) and the US Environmental Protection Agency.

Containment Design

Columbia Ridge has a multi-layer composite liner system that includes an engineered clay barrier and a 60-mil high-density polyethylene (HDPE) membrane to ensure that waste and wastewater (leachate) are contained and isolated from soil and groundwater.

Groundwater Monitoring

The site's geology and hydrogeology provide unique natural protections because the groundwater is approximately 200 feet deep and separated from the waste by low permeability soils. Groundwater is monitored at seven wells, both upgradient and downgradient of the waste disposal footprint.

Landfill Gas Management

Columbia Ridge manages landfill gas to generate renewable energy, reduce emissions, and prevent odor. The system collects 6,700 cubic feet per minute of landfill gas through more than more than 100 wells. A portion of the gas is sent to an on-site energy plant, with the remaining gas managed by flares per federal requirements.

YEAR OPENED

1990

PROJECTED LIFE REMAINING

143 years

FACILITY ACREAGE

12,000 acres

PERMITTED FOOTPRINT

700 acres

REMAINING PERMITTED CAPACITY

329 million tons

TONS PROCESSED ANNUALLY

2.74 million in 2017

OWNERSHIP

Waste Management Disposal Services of Oregon

PERMIT TYPE & PERMIT #

DEQ Solid Waste Permit #391

EMPLOYEES

111

WASTE MANAGEMENT

THINK GREEN®

Leachate Collection & Treatment

The leachate collection and treatment system consists of a highly permeable gravel drainage layer covering the entire landfill base, with perforated pipes at low points to collect and route leachate to a double composite-lined evaporation pond. It also includes a recirculation process that pumps leachate from the pond back into the landfill, to accelerate waste decomposition and enhance landfill gas production.

Acceptable Material

- Abrasive Blast Media
- Agricultural Wastes
- Animal Carcasses
- Asbestos-Containing Material (Friable & Non Friable)
- Auto Shredder Residue
- Biosolids
- Construction & Demolition (C&D) Debris CERCLA Wastes
- Dredged Wet Sediments
- Filter Cake
- Incinerator Ash
- Industrial & Special Wastes
- Medical Waste (Treated)
- Municipal Solid Waste (MSW) Petroleum Contaminated Soil Sludge
- Treated Wood

Unacceptable Material

- Appliances
- Batteries
- Discarded Vehicles Hazardous Wastes
- Loose Sharps
- Tires
- Used Oil

Additional Services Provided

- Electronic Waste Recycling
- Household Recycling Drop-off
- On-site Rail Spur
- Transportation Services
- White Goods Recycling

Renewable Energy

The energy plant at Columbia Ridge uses landfill gas to generate renewable energy as part of Waste Management's increasing focus on extracting value from waste. Gas collected from the landfill powers 12 engines to produce 12.8 MW of electricity—enough to power 12,500 homes in Seattle through an agreement with the City of Seattle.

In addition, Columbia Ridge is home to 92 wind turbines with the capacity to generate more than 150 MW.

Community Partnerships

Columbia Ridge is proud to be a valued community partner in ways that are visible in every direction across the Gilliam County landscape:

- **Family-wage Jobs:** Columbia Ridge provides 111 family-wage jobs with full benefits, training and development opportunities.
- **Infrastructure and Economic Development:** Columbia Ridge pays Gilliam County an annual host fee to support essential public sector services, capital improvements and economic development. WM voluntarily initiated the host fee agreement in 1990 as a demonstration of community partnership. In 2018, WM paid Gilliam County $4 million in host fee payments.
- **Community Donations:** WM donates generously to support youth and community vitality across Gilliam County. In 2019, WM's contributions totaled more than $50,000—largely to support the chambers of commerce in Arlington and Condon, the Gilliam County Fair, the WM Community Partnership Scholarship Program (college scholarships for local students).

CONTACT

Technical Support
TSC Portland
800.685.8001 or 800.963.4776
TSCPortland@wm.com

COMMUNITY RELATIONS

Jackie Lang
503.493.7848
jjlang@wm.com

COMMUNITIES SERVED

Oregon
Washington
Idaho
Alaska
Canada

WASTE MANAGEMENT

THINK GREEN®

Attachment 6. Maximum Total Sound Power Specifications

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GE Renewable Energy

Technical Documentation
Wind Turbine Generator Systems
2.5-127-Repower With LNTE - 60Hz

Product Acoustic Specifications
Normal Operation according to IEC

Incl. Octave and 1/3rd Octave Band Spectra

Customer:	Caithness
Project:	Caithness 2.5-127 Repower
Hub Height:	85m
Rev. 01 - EN	2019-07-29

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Table of Contents

1 Introduction

1.1 General

This document summarizes the acoustic emission characteristics of 2.5-127-Repower wind turbine for normal operation, including apparent sound power levels $L_{WA,k}$, as well as uncertainty levels associated with the sound power levels, tonal audibility, and octave and 1/3rd-octave band sound power levels.

All provided sound power levels are A-weighted.

GE continuously verifies specifications with measurements, including those performed by independent institutes.

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In noise-constrained areas it is often necessary to adapt the wind turbine operation to satisfy far-field noise limits. GE offers a dedicated Farm Noise Management system that provides greater flexibility and higher energy yield than standard turbine controls. This advanced scheme allows to continuously adjust the farm operation based on the environmental variables that influence farm noise emission, essentially wind speed and wind direction.

The Wind Farm Noise Management package includes the following service and hardware:

- Park level noise propagation modeling and optimization of wind farm operation,
- Table with optimum turbine set-points across the park as a function of wind speed and wind sector,
- Installation and commissioning of the Farm Noise Management Software Package.

2 Normal Operation Apparent Sound Power Levels

The apparent sound power levels $L_{WA,k}$ are given as a function of the hub height wind speed v_{HH}. The corresponding wind speeds v_{10m} at 10 m height above ground level have been derived assuming a logarithmic wind profile. In this case a reference surface roughness according to IEC 61400-11 of $z_{0,ref}$ = 0.05 m has been used, which is representative of average terrain conditions[1].

$$v_{10m} = v_{HH} \frac{\ln\left(10m / z_{0ref}\right)}{\ln\left(hub\ height / z_{0ref}\right)}$$ [2]

The apparent sound power levels $L_{WA,k}$ and the associated octave-band spectra are given in Table 1 for different hub heights. The values are provided for Normal Operation (NO) turbine mode.

[1] Note, that under site-specific conditions, other values of roughness length might be appropriate.

[2] Simplified from IEC 61400-11, ed. 2.1: 2006 equation 7

Normal Operation - A-weighted Octave Spectra [dB]													
Hub Height Wind Speed [m/s]		**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Wind speed at 10 m height for a hub height of 85 m [m/s]		**2.8**	**3.6**	**4.3**	**5.0**	**5.7**	**6.4**	**7.1**	**7.8**	**8.5**	**9.3**	**10.0**	**10.7**
Frequency [Hz]	**16**	57.3	57.3	59.7	62.1	65.6	64.6	64.6	64.6	64.6	64.6	64.6	64.6
	32	71.4	71.4	73.7	76.1	79.6	78.4	78.4	78.4	78.4	78.4	78.4	78.4
	63	81.0	81.0	83.7	86.2	89.5	88.0	88.0	88.0	88.0	88.0	88.0	88.0
	125	85.6	85.6	89.6	92.3	94.3	92.5	92.5	92.5	92.5	92.5	92.5	92.5
	250	87.3	87.3	92.1	95.4	96.0	94.2	94.2	94.2	94.2	94.2	94.2	94.2
	500	87.4	87.4	91.2	95.0	97.2	96.6	96.6	96.6	96.6	96.6	96.6	96.6
	1000	88.8	88.8	91.3	94.6	99.3	100.4	100.4	100.4	100.4	100.4	100.4	100.4
	2000	88.5	88.5	91.0	93.6	98.3	99.6	99.6	99.6	99.6	99.6	99.6	99.6
	4000	83.4	83.4	86.3	88.8	92.6	92.8	92.8	92.8	92.8	92.8	92.8	92.8
	8000	68.4	68.4	72.1	75.3	78.6	75.7	75.7	75.7	75.7	75.7	75.7	75.7
Total Sound Power Level [dB]		**95.2**	**95.2**	**98.5**	**101.7**	**104.8**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**

Table 1: Normal Operation Apparent Sound Power Level as a function of wind speeds

3 Uncertainty Levels

The apparent sound power levels given above are mean values of representative batches of turbines under evaluation. Uncertainty levels are not included. The uncertainty levels u_c, σ_P, σ_R and σ_T associated with measurements and mean values are described in IEC 61400-11 and IEC/TS 61400-14.

For GE wind turbines, a typical value of σ_P = 0.8 dB can be assumed.

The uncertainties for octave and 1/3rd-octave sound power levels are generally higher than for total sound power levels. Guidance is given in IEC 61400-11.

4 Tonal Audibility

The tonal audibility, when measured in accordance with the IEC 61400-11 standard, for the 2.5-127-Repower is $\Delta L_{a,k} \leq 4$ dB.

5 IEC 61400-11 and IEC/TS 61400-14 Terminology

- $L_{WA,K}$ is the wind turbine apparent sound power level (referenced to 10^{-12}W) measured with A-weighting as a function of wind speed. Derived from multiple measurement reports per IEC 61400-11, it is considered to be a mean value.
- u_c is the measurement uncertainty for acoustic testing as defined in IEC 61400-11. It is not a characteristic of the product, but of the measurement, and cannot be specified by GE. For average testing conditions, typical values of u_c are 0,7 dB – 1,0 dB.
- σ_P is the 2.5-127-Repower unit-to-unit product variation according to IEC/TS 61400-14. It is a characteristic of the product and can therefore be specified by GE (see chapter 3).
- σ_R is the overall measurement testing reproducibility as defined in IEC/TS 61400-14. It is not a characteristic of the product, but of the measurements, and cannot be specified by GE. For typical testing according to IEC 61400-11, a value of σ_R = 0,5 dB is widely accepted.
- σ_T is the total standard deviation combining both σ_P and σ_R (see IEC/TS 61400-14).
- $\Delta L_{a,k}$ is the tonal audibility according to IEC 61400-11, described as potentially audible narrow band sound

6 1/3rd-Octave Band Spectra

The tables in Annex I are showing the 1/3rd-octave band values for different wind speeds.

7 Reference Documents

- IEC 61400-11, wind turbine generator systems part 11: Acoustic noise measurement techniques, ed. 2.1 (2006-11), or ed. 3 (2012-11)
- IEC/TS 61400-14, Wind turbines – part 14: Declaration of apparent sound power level and tonality values, ed. 1 (2005-03)
- MNPT – Machine Noise Performance Test, Technical documentation

Annex I - 1/3rd-Octave Band Apparent Sound Power Level $L_{WA,k}$

Normal Operation – 1/3rd-Octave Spectra [dB]													
Hub Height Wind Speed [m/s]		**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Wind speed at 10 m height for a hub height of 85 m [m/s]		**2.8**	**3.6**	**4.3**	**5.0**	**5.7**	**6.4**	**7.1**	**7.8**	**8.5**	**9.3**	**10.0**	**10.7**
Frequency [Hz]	**12.5**	43.6	43.6	46.1	48.6	52.3	51.6	51.6	51.6	51.6	51.6	51.6	51.6
	16	50.5	50.5	52.9	55.3	58.9	58.0	58.0	58.0	58.0	58.0	58.0	58.0
	20	56.1	56.1	58.4	60.8	64.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3
	25	61.0	61.0	63.3	65.7	69.2	68.1	68.1	68.1	68.1	68.1	68.1	68.1
	32	65.5	65.5	67.8	70.2	73.7	72.5	72.5	72.5	72.5	72.5	72.5	72.5
	40	69.5	69.5	71.9	74.3	77.8	76.5	76.5	76.5	76.5	76.5	76.5	76.5
	50	72.7	72.7	75.2	77.6	81.1	79.8	79.8	79.8	79.8	79.8	79.8	79.8
	63	75.7	75.7	78.4	80.9	84.2	82.8	82.8	82.8	82.8	82.8	82.8	82.8
	80	78.4	78.4	81.3	83.8	87.0	85.4	85.4	85.4	85.4	85.4	85.4	85.4
	100	80.0	80.0	83.3	85.9	88.8	87.1	87.1	87.1	87.1	87.1	87.1	87.1
	125	81.0	81.0	84.8	87.4	89.6	87.9	87.9	87.9	87.9	87.9	87.9	87.9
	160	81.5	81.5	85.9	88.7	90.1	88.2	88.2	88.2	88.2	88.2	88.2	88.2
	200	82.1	82.1	86.9	89.9	90.6	88.7	88.7	88.7	88.7	88.7	88.7	88.7
	250	82.6	82.6	87.4	90.8	91.2	89.3	89.3	89.3	89.3	89.3	89.3	89.3
	315	83.0	83.0	87.5	91.2	91.8	90.2	90.2	90.2	90.2	90.2	90.2	90.2
	400	82.5	82.5	86.7	90.5	91.8	90.5	90.5	90.5	90.5	90.5	90.5	90.5
	500	82.7	82.7	86.4	90.3	92.4	91.7	91.7	91.7	91.7	91.7	91.7	91.7
	630	82.8	82.8	86.1	89.9	93.0	92.9	92.9	92.9	92.9	92.9	92.9	92.9
	800	83.2	83.2	86.0	89.6	93.6	94.2	94.2	94.2	94.2	94.2	94.2	94.2
	1000	83.8	83.8	86.4	89.7	94.4	95.5	95.5	95.5	95.5	95.5	95.5	95.5
	1250	84.8	84.8	87.3	90.3	95.3	96.8	96.8	96.8	96.8	96.8	96.8	96.8
	1600	84.4	84.4	86.8	89.5	94.5	96.0	96.0	96.0	96.0	96.0	96.0	96.0
	2000	83.9	83.9	86.4	89.0	93.7	94.9	94.9	94.9	94.9	94.9	94.9	94.9
	2500	82.9	82.9	85.4	87.8	92.1	93.3	93.3	93.3	93.3	93.3	93.3	93.3
	3150	81.1	81.1	83.8	86.2	90.2	91.1	91.1	91.1	91.1	91.1	91.1	91.1
	4000	78.0	78.0	81.1	83.6	87.3	86.8	86.8	86.8	86.8	86.8	86.8	86.8
	5000	73.9	73.9	77.4	80.2	83.6	81.9	81.9	81.9	81.9	81.9	81.9	81.9
	6300	67.9	67.9	71.5	74.7	78.0	75.2	75.2	75.2	75.2	75.2	75.2	75.2
	8000	58.5	58.5	62.7	66.0	69.5	66.1	66.1	66.1	66.1	66.1	66.1	66.1
	10000	46.3	46.3	50.9	54.4	58.0	54.8	54.8	54.8	54.8	54.8	54.8	54.8
Total Sound Power Level [dB]		**95.2**	**95.2**	**98.5**	**101.7**	**104.8**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**

Table 2: Apparent 1/3rd-Octave Band Sound Power Levels (A-weighted) as function of Wind Speed

GE Renewable Energy

Technical Documentation
Wind Turbine Generator Systems
2.5-116-Repower With LNTE - 60Hz

Product Acoustic Specifications

Normal Operation according to IEC

Incl. Octave and 1/3rd Octave Band Spectra

Customer:	Caithness
Project:	Caithness 2.5-116 Repower
Hub Height:	85m
Rev. 01 - EN	2019-09-20

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Normal Operation - A-weighted Octave Spectra [dB]													
Hub Height Wind Speed [m/s]		**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Wind speed at 10 m height for a hub height of 85 m [m/s]		**2.8**	**3.6**	**4.3**	**5.0**	**5.7**	**6.4**	**7.1**	**7.8**	**8.5**	**9.3**	**10.0**	**10.7**
Frequency [Hz]	**16**	56.8	56.8	59.3	62.1	64.7	63.8	63.8	63.8	63.8	63.8	63.8	63.8
	32	70.5	70.5	73.0	75.9	78.5	77.4	77.4	77.4	77.4	77.4	77.4	77.4
	63	80.0	80.0	82.8	85.7	88.3	86.9	86.9	86.9	86.9	86.9	86.9	86.9
	125	85.1	85.1	88.5	91.1	93.5	91.7	91.7	91.7	91.7	91.7	91.7	91.7
	250	87.8	87.8	91.5	94.4	96.5	95.1	95.1	95.1	95.1	95.1	95.1	95.1
	500	88.2	88.2	91.6	95.1	98.1	98.4	98.4	98.4	98.4	98.4	98.4	98.4
	1000	88.5	88.5	91.5	95.3	98.9	100.7	100.7	100.7	100.7	100.7	100.7	100.7
	2000	86.7	86.7	89.7	93.2	96.7	98.2	98.2	98.2	98.2	98.2	98.2	98.2
	4000	80.3	80.3	83.4	86.6	89.9	90.3	90.3	90.3	90.3	90.3	90.3	90.3
	8000	65.1	65.1	68.4	71.5	74.3	71.6	71.6	71.6	71.6	71.6	71.6	71.6
Total Sound Power Level [dB]		**94.8**	**94.8**	**98.0**	**101.4**	**104.4**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**

Table 1: Normal Operation Apparent Sound Power Level as a function of wind speeds

3 Uncertainty Levels

The apparent sound power levels given above are mean values of representative batches of turbines under evaluation. Uncertainty levels are not included. The uncertainty levels u_c, σ_P, σ_R and σ_T associated with measurements and mean values are described in IEC 61400-11 and IEC/TS 61400-14.

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The uncertainties for octave and 1/3rd-octave sound power levels are generally higher than for total sound power levels. Guidance is given in IEC 61400-11.

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The tonal audibility, when measured in accordance with the IEC 61400-11 standard, for the 2.5-116-Repower is $\Delta L_{a,k} \leq 4$ dB.

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- $L_{WA,K}$ is the wind turbine apparent sound power level (referenced to 10^{-12}W) measured with A-weighting as a function of wind speed. Derived from multiple measurement reports per IEC 61400-11, it is considered to be a mean value.
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- σ_P is the 2.5-116-Repower unit-to-unit product variation according to IEC/TS 61400-14. It is a characteristic of the product and can therefore be specified by GE (see chapter 3).
- σ_R is the overall measurement testing reproducibility as defined in IEC/TS 61400-14. It is not a characteristic of the product, but of the measurements, and cannot be specified by GE. For typical testing according to IEC 61400-11, a value of σ_R = 0,5 dB is widely accepted.
- σ_T is the total standard deviation combining both σ_P and σ_R (see IEC/TS 61400-14).
- $\Delta L_{a,k}$ is the tonal audibility according to IEC 61400-11, described as potentially audible narrow band sound

6 1/3rd-Octave Band Spectra

The tables in Annex I are showing the 1/3rd-octave band values for different wind speeds.

7 Reference Documents

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- IEC/TS 61400-14, Wind turbines – part 14: Declaration of apparent sound power level and tonality values, ed. 1 (2005-03)
- MNPT – Machine Noise Performance Test, Technical documentation

Annex I - 1/3rd-Octave Band Apparent Sound Power Level $L_{WA,k}$

Normal Operation – 1/3rd-Octave Spectra [dB]													
Hub Height Wind Speed [m/s]		**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Wind speed at 10 m height for a hub height of 85 m [m/s]		**2.8**	**3.6**	**4.3**	**5.0**	**5.7**	**6.4**	**7.1**	**7.8**	**8.5**	**9.3**	**10.0**	**10.7**
Frequency [Hz]	**12.5**	43.4	43.4	46.0	48.9	51.6	50.9	50.9	50.9	50.9	50.9	50.9	50.9
	16	50.1	50.1	52.6	55.5	58.1	57.2	57.2	57.2	57.2	57.2	57.2	57.2
	20	55.4	55.4	58.0	60.8	63.4	62.5	62.5	62.5	62.5	62.5	62.5	62.5
	25	60.3	60.3	62.8	65.6	68.2	67.2	67.2	67.2	67.2	67.2	67.2	67.2
	32	64.6	64.6	67.2	70.0	72.6	71.6	71.6	71.6	71.6	71.6	71.6	71.6
	40	68.5	68.5	71.1	74.0	76.7	75.5	75.5	75.5	75.5	75.5	75.5	75.5
	50	71.7	71.7	74.4	77.3	79.9	78.7	78.7	78.7	78.7	78.7	78.7	78.7
	63	74.8	74.8	77.6	80.5	83.1	81.7	81.7	81.7	81.7	81.7	81.7	81.7
	80	77.4	77.4	80.3	83.2	85.8	84.3	84.3	84.3	84.3	84.3	84.3	84.3
	100	79.1	79.1	82.1	84.9	87.5	85.9	85.9	85.9	85.9	85.9	85.9	85.9
	125	80.4	80.4	83.7	86.3	88.7	86.9	86.9	86.9	86.9	86.9	86.9	86.9
	160	81.3	81.3	84.9	87.5	89.7	87.9	87.9	87.9	87.9	87.9	87.9	87.9
	200	82.3	82.3	86.0	88.7	90.7	88.9	88.9	88.9	88.9	88.9	88.9	88.9
	250	83.0	83.0	86.8	89.7	91.7	90.1	90.1	90.1	90.1	90.1	90.1	90.1
	315	83.6	83.6	87.2	90.4	92.7	91.6	91.6	91.6	91.6	91.6	91.6	91.6
	400	83.3	83.3	86.8	90.2	92.8	92.3	92.3	92.3	92.3	92.3	92.3	92.3
	500	83.5	83.5	86.9	90.4	93.3	93.6	93.6	93.6	93.6	93.6	93.6	93.6
	630	83.6	83.6	86.8	90.5	93.6	94.7	94.7	94.7	94.7	94.7	94.7	94.7
	800	83.5	83.5	86.6	90.5	93.8	95.4	95.4	95.4	95.4	95.4	95.4	95.4
	1000	83.6	83.6	86.6	90.5	94.1	95.9	95.9	95.9	95.9	95.9	95.9	95.9
	1250	84.0	84.0	87.0	90.7	94.5	96.4	96.4	96.4	96.4	96.4	96.4	96.4
	1600	83.0	83.0	86.0	89.6	93.2	94.9	94.9	94.9	94.9	94.9	94.9	94.9
	2000	82.0	82.0	84.9	88.4	92.0	93.3	93.3	93.3	93.3	93.3	93.3	93.3
	2500	80.6	80.6	83.4	86.7	90.2	91.3	91.3	91.3	91.3	91.3	91.3	91.3
	3150	78.3	78.3	81.2	84.5	87.8	88.7	88.7	88.7	88.7	88.7	88.7	88.7
	4000	74.6	74.6	77.9	81.1	84.3	84.0	84.0	84.0	84.0	84.0	84.0	84.0
	5000	70.3	70.3	73.8	76.9	80.0	78.4	78.4	78.4	78.4	78.4	78.4	78.4
	6300	64.5	64.5	67.8	70.8	73.7	71.1	71.1	71.1	71.1	71.1	71.1	71.1
	8000	55.7	55.7	59.1	62.4	65.0	61.6	61.6	61.6	61.6	61.6	61.6	61.6
	10000	44.7	44.7	48.0	51.3	53.5	51.1	51.1	51.1	51.1	51.1	51.1	51.1
Total Sound Power Level [dB]		**94.8**	**94.8**	**98.0**	**101.4**	**104.4**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**	**105.0**

Table 2: Apparent 1/3rd-Octave Band Sound Power Levels (A-weighted) as function of Wind Speed